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# **Worldwide Environmental Compliance Assessment and Management System Program (ECAMP)**

## **U.S. Air Force *Turkey Supplement***

In response to the growing number of environmental laws and regulations worldwide, the Air Force adopted an environmental compliance program that identifies compliance problems before they are cited as violations by the U.S. Environmental Protection Agency (USEPA).

Beginning in 1984, the U.S. Army Construction Engineering Research Laboratories, in cooperation with the Air Force Engineering and Services Center, began research on ECAMP. Federal, Department of Defense (DOD), and Air Force environmental regulations, along with documentation of good management practices and risk-management information, were integrated into a series of checklists that show (1) legal requirements and (2) which specific items or operations to review. Assessment protocols list a point of contact to help assessors review the checklists quickly and effectively.

The Worldwide ECAMP incorporates existing checklists from the USEPA and private industry. It also integrates the Overseas Environmental Baseline Guidance Document (OEBGD), published by the DOD in October 1992. Additionally, Worldwide ECAMP includes pertinent information from Air Force Regulations, DOD Directives and Instructions, and cited good management practices for an overall environmental review. The Turkey manual supplements Worldwide ECAMP using existing Turkish laws and regulations, and suggested management practices. The program was tested at Incirlik and Piriçlik Air Force Bases, Turkey in May 1993.

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## FOREWORD

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LTC David J. Rehbein is Commander of USACERL and Dr. L.R. Shaffer is Director.

## NOTICE

This manual is intended as general guidance for personnel at certain U.S. Air Force installations. It is not, nor is it intended to be, a complete treatise on environmental laws and regulations. Neither the U.S. Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information contained herein. For any specific questions about, or interpretations of, the legal references herein, consult appropriate legal counsel.

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## INTRODUCTION

### A. Applicability

The purpose of this manual is to provide information on Turkish environmental laws and regulations in relation to activities and processes that occur on U.S. Air Force installations located in Turkey.

### B. Background Information

- *The Environmental Law*, Law No. 2872, outlines the general principles for environmental protection and pollution prevention. The current objectives for the environment in Turkey are to preserve and improve the environment which is the common property of all the citizens, to use and protect in the best possible manner the land and the natural resources both in rural and urban areas, to avoid the pollution of water, land, and air, to preserve the fauna and flora of the country as well as her natural and historical riches, and to develop and protect the health, the civilization and living standards of the present day population and of future generations and to arrange all these and the measures to be taken within the framework of economic and social development targets on the basis of well established legal and technical background (Law No. 2872, Article 1).

The protection and pollution prevention of the environment is the duty of all citizens who are obliged to comply with the measures to be taken in this regard and to abide by the principles to be set down.

In the application and formulation of the decision and measures related to the prevention and pollution of the environment, the principle is to see to it that the health of human beings is to protected and that a short and long term evaluation of the measures to be taken is made and their pros and cons with regard to the developmental efforts spent.

The authorized persons deciding on the utilization of land and natural resources and making evaluations of projects must take into consideration the fact that to protect the environment and avoid its pollution do not adversely affect the developmental efforts.

The most suitable technologies and methods are selected and applied in economic activities and in the determination of production methods in view of prevention of environmental problems and in their reduction.



With some exceptions, the expenses incurred in preventing, reducing and fighting against pollution shall be paid by polluter. The expenses made for prevention of pollution by any government offices directly or in the case of avoidance of the polluter shall be collected from the polluter according to law No. 6183. However, the polluter can be redeemed from the obligation of payment if they prove that they took all of the possible cautions against prevention of pollution.

- *Memorandum of Understanding between the Environmental Protection Agency and The Ministry of Environment of the Republic of Turkey Concerning Technical Cooperation in the Field of Environmental Protection.* This memorandum, published 26 Nisan 1992 in the *Official Gazette* establishes an agreement between the USEPA and the Turkish government for technical cooperative activities in relation to the environment. Technical cooperative activities consist of training projects designed to help strengthen environmental management systems and institutions, assistance in developing management systems, and related technical cooperative projects. Additional activities may include: training of personnel of the Ministry in the areas of policy, enforcement, pollution prevention and environmental impact assessment; assistance to the Ministry in such areas as information management, solid and hazardous waste management, and improvement in administrative systems; exchange visits of technical personnel and other such technical cooperative activities as are agreed upon.

### C. Legislative Organization

- *The Supreme Environmental Council.* This council is formed under the presidency of the Prime Minister or of the relative Minister of State that the Prime Minister will appoint, by the ministers of the Interior Health and Social Assistance, of Communications, of Agriculture and Forestry, of Industry and Technology, of Energy and Natural Resources, of Restoration and Housing, of Village affairs and Cooperatives, and by the Undersecretaries of the State Planning Organization and of the Prime Ministry related with environmental affairs. The function of the secretariat of the Council is assumed by the Environmental Under-secretary of the Prime Ministry. The Council meets every three months and may be convened when need be to hold a meeting.

The Council performs the following functions:

- makes decisions in principle for the protection of environment, prevention of environmental pollution and the improvement thereof;
- revises the activities and sets down the principles and targets of future terms;
- studies the plans and programs related with environmental pollution;

- establishes the technology suiting the country's conditions for the protection of the environment and for the prevention of its pollution and determine the characteristics of the facilities to be established to do this;
  - establishes the principles of usage of urban and rural areas;
  - determines the areas where pollution exists likely to occur
  - establishes the principles of collaboration and cooperation between various ministries and organizations who will be involved in the fight against environmental pollution and in the avoidance of the said pollution (Law No. 2872, Articles 4 and 5).
- *The Local Environmental Council.* In every province a Local Environmental Council will be formed that consists of the Provincial Administration Chiefs, the Mayor, the representative of higher education of the province, if any, and the Head of the Chamber of Industry under the presidency of Governor himself. The secretarial work of this Council is assumed by the Health Departments of the Province. The Council meets once a month and may be convened to meet by the president.

The duties of the Local Environmental Council include:

- making the necessary decisions for the protection of environment and the prevention of pollution within the framework of the decisions of the Supreme Environmental Council;
- preparing the activity program on a provincial scale for the protection of the environment and prevention of its pollution and see to it that it is realized;
- following up the activities of various ministries and organizations in the province, to give them uniformity, to orient them and bring about the necessary coordination in this respect;
- examining and evaluating the reports related to the control carried out of organization and facilities established in the province with respect to environmental pollution and to take the necessary measures;
- arranging training possibilities in subjects involving measures to be taken against environmental pollution;
- determining the problems related to the environment on a provincial scale and report them to the under-secretariat dealing with environmental affairs of the Prime Ministry with suggested solution (Law No. 2872, Articles 6 and 7).

- *The Ministry of Health and Social Assistance*,. When environmental pollution becomes a threat to the public health, this Ministry may, either on its own decision or by request of the Environmental Under-secretariat of Prime Ministry, stop temporarily or permanently the activities causing the pollution by the mediation of the highest civil authority of the district. Activities may also be stopped by the decision of the highest civil authority of the district when need be. The decision in question is immediately reported to the Ministry of Health and Social Assistance (Law No. 2872, Article 16).

#### **D. Governing Policy**

In general, organizations, associations and businesses planning to be established are obliged to set up their own independent or common purification systems or facilities foreseen in the rules and regulations. Unless they have set up and made ready to operate the purification system or facilities, the organizations, associations and businesses may not be granted permission to carry on activities. An organization, association and business starting operations after obtaining a license shall give notice of any change or extension of its activities it is contemplating before the change to the highest civil authority of the district. In addition, organizations are obliged to purify, remove or dispose of all sorts of wastes and leftovers shall take the necessary measure to prevent any occurrence likely to cause adverse effects to the environment (Law No. 2872, Article 11).

The highest civil authority of a district is required to grant organizations, associations, and businesses that are out of compliance a long enough period of time to correct violation and/or fulfill future action required by the law. If there is continued non-compliance, the activities of the organizations, businesses, or associations will be stopped either for a certain term or for good, partially or entirely, according to characteristics of the violation (Law No. 2872, Article 15).

#### **E. Fundamental Definitions**

- *Ecological Balance* - the totality of the conditions required for the survival and development of human and other living beings (Law No. 2872, Article 2)
- *Environmental Pollution* - the imbalance brought about in the ecological conditions as a result of untoward effects of pollution in the air, land, and water caused by man's activities as well as the undesired consequences thereof, like nasty odors, noises and wastes (Law No. 2872, Article 2).
- *Polluting Agents* - physical and legal persons causing directly or indirectly the said environmental pollution (Law No. 2872, Article 2).

- *Preservation of Environment* - the preservation of the ecological balance, the avoidance and the pollution of air, land, and water, and the perpetuation of the existing welfare, and all the activities oriented to said purpose (Law No. 2872, Article 2).



**Section 1**

**Air Emissions Management**

## Section 1

### AIR EMISSIONS MANAGEMENT

#### A. Applicability

Since it can be expected that air emissions will be produced as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *The Air Quality Protection Rule.* This rule became effective upon publication in *Official Gazette* number 19269 on 2 November 1986. The purpose of this rule is to regulate emissions of soot, smoke, dust, gases, steam, and aerosols into the atmosphere as a result of activities of any kind in order to:
  - protect human beings and their environment
  - eliminate adverse environmental effects of air pollution
  - ensure that adverse environmental effects are not created.

This rule does not apply to the following:

- plants, apparatus and machinery under the jurisdiction of the Atomic Energy Commission of Turkey according to law No. 2690 in the protection of human health and the environment from radiation by nuclear and other radioactive substances
- the atmosphere of workplaces covered by worker health and safety regulations
- plants, apparatus and machinery that produce no emission into the air as a receptor medium.

#### C. State Laws and Regulations

- None available at this time. But, the *Air Quality Protection Regulations* specifically grants the Provincial Governor the power to regulate the following:
  - the creation of special regulations in the event of adverse meteorological conditions, including restricting traffic (*Air Quality Protection Regulation*, Section 5).
  - the designation of pollution-sensitive zones and restriction on activities in these zones such as:
    - prohibition of the operation of moving installations
    - prohibition of the construction of stationary plants

- restrictions on the time of operation of stationary plants
- restrictions on the processing techniques used in stationary plants
- prohibitions or restrictions on the use of fuel at plants.

#### **D. Key Compliance Definitions**

- **Air Pollutants** - chemical substances in the form of soot, smoke, dust, gas, steam and aerosols which alter the natural composition of the air (The Air Quality Protection Regulation, Article 5).
- **Air Quality** - the quality of the atmosphere which is lowered by increasing amounts of air pollutants in the ambient air and which is an indicator of the effects of air pollution on human beings and their environment (The Air Quality Protection Regulation, Article 5).
- **Emissions** - the air pollutants that are released into the atmosphere from plants as the result of fuel and similar substances, or as the result of the burning of fuel and similar substances, or as the result of synthesis, decomposition, vaporization and similar processes, or as the result of the accumulation, separation, or transportation of materials or of other similar physical processes. (Air Quality Protection Regulation, Article 5).
- **Long Term Standard (LTS)** - values that are the arithmetic mean of all measurement results, and that must not be exceeded, usually covers a one year period (Air Quality Protection Regulation, Article 6, para A).
- **Old Plant** - plants either built or already being built before 2 November 1986 (Air Quality Protection Regulation, Annex 1).
- **Permission** - a permit, specifically an emissions permit (Air Quality Protection Regulation, Article 5).
- **Plant** - this includes:
  - corporations, companies, business enterprises and other stationary sources
  - machinery, apparatuses and other movable technical equipment as well as motor vehicles
  - the property on which materials are stored or deposited or where work is done (Air Quality Protection Regulations, Article 5)



- ***Pollution Sensitive Zones*** - zones in which air pollution has occurred or is anticipated, and where serious harmful effects may be produced due to the hazard created by the frequency and length of periods of air pollution, the high concentrations reached, and the presence of various pollutants in the air at once. These zones are determined by the Provincial Governors' Offices in consultation with the Prime Ministry General Directorate of Environment (Air Quality Protection Regulations, Section 6, Article 49).
- ***Preliminary Permissions*** - a preliminary emissions permit (Air Quality Protection Regulation (Air Quality Protection Regulation, Article 5).
- ***Produce*** - includes production, operation, consumption and other uses for the purpose of production. Importation and other forms of operation, as which make emissions limiting measures practicable and usable (Air Quality Protection Regulation, Article 5).
- ***Short Term Standards (STS)*** - values that must not exceed 95 percent of the measurement results when the numerical value of all measurement results, the form of maximum daily average or statistics, are arranged by size. In the case of settling dust, in contrast, these values refer to the maximum monthly averages that must not be exceeded (Air Quality Protection Regulation, Article 6, para B).
- ***Technological Level*** - the level attained by the technological methods, apparatuses, forms of operation and purification methods which are capable of implementation under present and future country conditions, which have been proven by experience, which are capable of inspection by comparable methods, apparatuses and forms of operation, which which make emission limiting measures practicable and usable (Air Quality Protection Regulation, Article 5).
- ***Type and Emissions License*** - a document certifying that the design specifications of plants of various models and their parts, which are not subject to permission but which produce emissions, as well as their output, capacity and emission levels are in line with the provisions of this regulation (Air Quality Protection Regulation, Article 5).



# AIR EMISSIONS MANAGEMENT

## GUIDANCE FOR CHECKLIST USERS

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	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: (*)
All installations	1-1 through 1-4	(1)(2)
Permit requirements	1-5 through 1-9	(1)(2)(3)
Non-permitted sources	1-10 and 1-11	(1)(2)(3)(4)(7)(8)(9)(10)
General Emission standards	1-12 and 1-13	(1)(2)(3)(4)(6)(9)
Permitted source emissions	1-14 through 1-26	(1)(2)(3)
Furnaces and boilers	1-27 through 1-38	(1)(2)(3)(8)
Incinerators	1-39 through 1-46	(1)(2)(3)
Air emissions accidents	1-46	(1)(2)(3)
Air quality inspectors	1-47 and 1-48	(1)(2)(3)
Emissions measurements	1-49 through 1-51	(1)(2)(3)
Vehicle Emissions	1-52	(1)(5)(9)(10)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Base Civil Engineering/Environmental Planning)
- (2) BEE (Bioenvironmental Engineering)
- (3) Air Pollution Source Operator
- (4) Fuels - Management Branch
- (5) Transportation - Maintenance Branch
- (6) LGS (Base Supply)
- (7) MWR (Morale, Welfare, and Recreation) Auto Hobby Shop
- (8) Refrigeration Shops (BCE)
- (9) Equipment Maintenance Squadron
- (10) AAFES (Army/Air Force Exchange Service) Gas Station



## **AIR EMISSIONS MANAGEMENT**

### **Records to Review**

- Host Country air pollution control regulations
- Emissions inventory
- All air pollution source permits
- Plans and procedures applicable to air pollution control
- Emission monitoring records
- Opacity records
- Instrument calibration and maintenance records
- Reports/complaints concerning air quality
- Air Emergency Episode Plan
- Host Country regulatory inspection reports
- Documentation of preventive measures or actions
- Results of air sampling at the conclusion of response action

### **Physical Features to Inspect**

- All air pollution sources (fuel burners, incinerators, VOC sources, etc.)
- Air pollution monitoring and control devices
- Air emission stacks
- Air intake vents

### **Sources to Interview**

- BCE (Base Civil Engineering/Environmental Planning)
- BEE (Bioenvironmental Engineering)
- Air Pollution Source Operator
- Fuels - Management Branch
- Transportation - Maintenance Branch
- LGS (Base Supply)
- MWR (Morale, Welfare, and Recreation) Auto Hobby Shop
- Refrigeration Shops (BCE)
- Equipment Maintenance Squadron
- AAFES (Army/Air Force Exchange Service) Gas Station



**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>ALL INSTALLATIONS</b></p> <p>1-1. Determine actions or changes since previous review of air emissions (GMP).</p> <p style="text-align: center;">...</p> <p>1-2. Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p>1-3. Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p> <p>1-4. The importation into Turkey of industrial plants which produce emissions into the air, or components of such plants, is subject to specific requirements (Air Quality Protection Regulation, Section 4, Article 44).</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>(NOTE: Regulations on asbestos management are addressed in Section 9, <i>Special Programs Management</i>)</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <p style="padding-left: 40px;">- <i>Air Quality Protection Regulation</i>, effective 2 November 1986.</p> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning air quality have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p> <p>Verify that industrial plants or components thereof imported into Turkey: (1)(2)</p> <ul style="list-style-type: none"> <li>- do not exceed the emission limits stipulated in the regulations</li> <li>- meet the technical specifications necessary for limiting their emissions</li> <li>- bear labels stating the types and levels of emissions that they produce.</li> </ul> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering/Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LOS (Base Supply) (7) MWR (Morale, Welfare, and Recreation) Auto Hobby Shop (8) Refrigeration Shops (BCE) (9) Equipment Maintenance Squadron (10) AAFES (Army/Air Force Exchange Service) Gas Station

COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
<b>PERMITS</b>	
<p>1-5. An emission permit is required for the construction and operation of certain types of plants (Air Quality Protection Regulation, Section 3, Article 10 and Article 24).</p> <p>...</p> <p>1-6. The construction and operation of plants requiring permits are to operate according to specific requirements (Air Quality Protection Regulation, Section 3, Article 11).</p> <p>...</p> <p>1-7. An additional permit is required for the modification of a plant requiring a permit (Air Quality Protection Regulation, Section 3, Article 21).</p> <p>...</p> <p>1-8. Plant operators are required to report whether or not there has been any deviation from the specifications in the permit (Air Quality Protection Regulation, Section 3, Article 22).</p> <p>...</p>	<p>Verify that a permit has been obtained for the construction and operation of a plant of any type listed in Table 1-1. (1)(2)(3)</p> <p>(NOTE: Permits may expire for either of the following reasons:</p> <ul style="list-style-type: none"> <li>- the plant has not gone into operation within the time envisaged in the permit</li> <li>- the plant has ceased to operate continuously for a period of three years (yr.))</li> </ul> <p>...</p> <p>Verify that plants requiring permits adhere to the following principles: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- the harmful effects of the plant on the public and on the environment are reduced in keeping with the technological level and do not create any hazards</li> <li>- the technological conditions laid down in the regulations are complied with</li> <li>- the emissions standards stated in the regulations are not exceeded</li> <li>- emissions and environmental air quality are measured by the plant operator in accordance with the methods stated in the regulations</li> <li>- the waste materials and discharges issuing from the plant are recycled, or if this is not economically or technically feasible, are appropriately disposed of.</li> </ul> <p>...</p> <p>Verify that a permit is obtained for any modification of the location, structure, or operation of a plant requiring a permit. (1)(2)(3)</p> <p>...</p> <p>Verify that the installation reports every two yr to the authorized official whether or not there has been any deviation from the specifications envisaged at the time the permit was granted, even if no modifications have been undertaken. (1)(2)(3)</p> <p>...</p>

(1) BCE (Base Civil Engineering/Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LGS (Base Supply) (7) MWR (Morale, Welfare, and Recreation) Auto Hobby Shop (8) Refrigeration Shops (BCE) (9) Equipment Maintenance Squadron (10) AAFES (Army/Air Force Exchange Service) Gas Station



**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>1-9.</b> The discontinuation of operation must be reported (Air Pollution Control Regulation, Section 3, Article 27).</p> <p style="text-align: center;">...</p>	<p>Verify that the discontinuation of operation of a plant requiring a permit is reported to the authorized official within 30 days. (1)(2)(3)</p> <p style="text-align: center;">...</p>
<p><b>NON-PERMITTED SOURCES</b></p> <p><b>1-10.</b> The construction and operation of plants not requiring a permit are subject to certain requirements (Air Pollution Protection Regulation, Section 3, Articles 29 and 30).</p> <p style="text-align: center;">...</p>	<p>Verify that any plant on the installation not requiring a permit meets the following requirements: (1)(2)(3)(4)(7)(8)(9)(10)</p> <ul style="list-style-type: none"> <li>- efforts are made to reduce environmentally harmful effects to the appropriate technological level</li> <li>- environmentally harmful effects that cannot be eliminated by the use of advanced technology are kept to a minimum</li> <li>- the wastes and effluents discharged by plant operations are disposed of by appropriate methods</li> <li>- the plant complies with standards published in the <i>Official Gazette</i> by the Turkish Standards Institute and the technical specifications issued by: <ul style="list-style-type: none"> <li>- the Prime Ministry</li> <li>- the Ministry of Industry and Trade</li> <li>- the Ministry of Energy and Natural Resources</li> <li>- all other public corporations and agencies</li> </ul> </li> <li>- actions taken are in line with the announcements issued by the local representatives of the central administration</li> <li>- emissions discharged do not exceed the limits stated in these regulations</li> <li>- the plant measures emissions and air quality in the form and with the frequency stated in these regulations or has such measurements made by competent agencies.</li> </ul> <p style="text-align: center;">...</p>
<p><b>1-11.</b> Plants which produce emissions but are not required to have a permit are required to have a type and emission license (Air Quality Protection Regulation, Section 3, Article 33).</p> <p style="text-align: center;">...</p>	<p>Verify that any plant on the installation which produces emissions but is not required to have a permit has a type and emission license. (1)(2)(3)</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering/Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LCS (Base Supply) (7) MWR (Morale, Welfare, and Recreation) Auto Hobby Shop (8) Refrigeration Shops (BCE) (9) Equipment Maintenance Squadrons (10) AAFES (Army/Air Force Exchange Service) Gas Station

COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>GENERAL EMISSION STANDARDS</b></p> <p>1-12. Waste gases must be released into the atmosphere in such a way as to be borne without obstruction by free air currents (Air Quality Protection Regulation, Section 2, Article 8, para 1).</p> <p>...</p> <p>1-13. Stacks for the release of waste gases must comply with the minimum height requirements for the size of plant (Air Quality Protection Regulation, Section 2, Article 8, paras 2 through 4).</p> <p>...</p>	<p>Verify that the escape rate from a stack when the plant is operating at its rated power is at least 6 meters per second (m/s). (1)(2)(3)(4)(6)(9)</p> <p>(NOTE: This requirement does not apply to plants whose rated thermal power is below 300 kilowatts (kW).)</p> <p>...</p> <p>Determine the size of the plant based on thermal power: (1)(2)(3)(4)(6)(9)</p> <ul style="list-style-type: none"> <li>- Small: thermal power less than 300 kW</li> <li>- Medium: thermal power between 300 kW and 1 megawatt (MW)</li> <li>- Large: thermal power of 1.2 MW or more.</li> </ul> <p>Verify that the stacks used in a small plant have a height of 0.5 m higher than the highest point of a sloping roof, or 1.5 m higher than the highest point of a flat roof.</p> <p>Verify that the stacks used in a medium-size plant have a height of 1 m higher than the highest point of a sloping roof, or 1 m higher than the highest point of flat roof or a roof with a slope of less than 20°.</p> <p>Verify that the stacks used in a large plant are at least</p> <ul style="list-style-type: none"> <li>- 19 m above the building foundation and at least 3m above the roof,</li> <li>- 3 m above the roof,</li> <li>- as high as determined by the formulas given in Annex 6 of the Air Quality Protection Regulation.</li> </ul> <p>...</p>

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<b>PERMITTED SOURCE EMISSIONS</b>	
<b>1-14.</b> For industrial plants that require permits, the concentrations of air pollutants are subject to specific limits (Air Quality Protection Regulation, Section 2, Article 6, para 1(A) and 1(B)).	Determine whether the annual average of the daily concentration measurements of air pollutants exceed the Long Term Standards given in Table 1-2. (1)(2)(3)
...	Determine whether the monthly averages of the concentration of settling dust exceed the Short Term Standard given in Table 1-2.
	Determine whether 5 percent or more of the annual daily measurements of pollutants other than settling dust exceed the Short Term Standards given in Table 1-2.
	(NOTE: When these limits are reached, local environmental units are required to develop programs to improve air quality.)
...	...
<b>1-15.</b> For industrial plants which require a permit, less stringent limits are applicable between October and March (Air Quality Protection Regulation, Section 2, Article 6, para 1(C)).	Determine whether the average daily concentrations between October and March of the following pollutants in the air exceed the following limits: (1)(2)(3)
...	Sulfur dioxide 250 micrograms (µg) /m <sup>3</sup>
	Suspended particulate matter 200 µg/m <sup>3</sup>
...	...
<b>1-16.</b> The concentration of certain pollutants in the air should meet certain Target Standards (GMP).	Determine whether the concentrations of sulfur dioxide and suspended particulate matter in the air meet the following limits: (1)(2)(3)
	SO <sub>2</sub> (µg/m <sup>3</sup> ) PM (µg/m <sup>3</sup> )
	Annual arithmetic average 60 60
	Winter (October through March) average 120 120
	Maximum 24-hour (h) limit 150 150
	One-h limit 450 -
	(NOTE: This GMP is based on Air Quality Protection Regulation, Article 6, para 2.)
...	...
<b>1-17.</b> For industrial plants which require a permit, specific limits apply for the amount of pollutants in settling dust, particularly in special conservation areas (Air Quality Protection Regulation, Section 2, Article 6, para 3).	Determine whether any parts of the installation are designated as special conservation areas designed to protect sensitive animals, plants, and objects from the harmful effects of air pollution. (1)(2)(3)
	Determine whether the concentration of air pollutants in special conservation areas on the installation exceed the limits given in Table 1-3.

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>1-18.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards for gas and steam emissions if the permit does not stipulate standards (Air Quality Protection Regulation, Section 2, Article 7, para 9).</p> <p style="text-align: center;">...</p>	<p>Verify that the emission of inorganic chlorine does not exceed 30 milligrams (mg) /m<sup>3</sup> of Cl<sup>-</sup> if gaseous inorganic chlorine emissions are 3 kilograms (kg) /h or more. (1)(2)(3)</p> <p>Verify that the emission of inorganic fluorine does not exceed 5 mg/m<sup>3</sup> of F<sup>-</sup> if gaseous inorganic fluorine emissions are 3 kg/h or more.</p> <p>Verify that the emission of the organic chemicals in class I of Table 1-4 does not exceed 20 mg/m<sup>3</sup> if the emission flow is 0.1 kg/h or more.</p> <p>Verify that the emission of the organic chemicals in class II of Table 1-4 does not exceed 150 mg/m<sup>3</sup> if the emission flow is 3 kg/h or more.</p> <p>Verify that the emission of the organic chemicals in class III of Table 1-4 does not exceed 300 mg/m<sup>3</sup> if the emission flow is 6 kg/h or more.</p> <p>Verify that the total emission of the organic chemicals in classes I, II, and III of Table 1-4 does not exceed 300 mg/m<sup>3</sup>.</p> <p style="text-align: center;">...</p>
<p><b>1-19.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards for emissions of carcinogens if the permit does not stipulate standards (Air Quality Protection Regulation, Section 2, Article 7, para 10).</p> <p style="text-align: center;">...</p>	<p>Verify that emissions of substances in class I of Table 1-5 do not exceed 0.1 mg/m<sup>3</sup> for emission flows of 0.5 grams (g) /h or more. (1)(2)(3)</p> <p>Verify that emissions of substances in class II of Table 1-5 do not exceed 1 mg/m<sup>3</sup> for emission flows of 5 g/h or more.</p> <p>Verify that emissions of substances in class I of Table 1-5 do not exceed 5 mg/m<sup>3</sup> for emission flows of 25 g/h or more.</p> <p>Verify that the total emissions of substances in Table 1-5 do not exceed 1 mg/m<sup>3</sup> if substances from classes I and II are released simultaneously.</p> <p>Verify that the total emissions of substances in Table 1-5 do not exceed 5 mg/m<sup>3</sup> if substances from classes I and III or II and III are released simultaneously.</p> <p style="text-align: center;">...</p>
<p><b>1-20.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards for emissions of soot if the permit does not stipulate standards (Air Quality Protection Regulation, Section 2, Article 7, para 1).</p> <p style="text-align: center;">...</p>	<p>Verify that the plume opacity of waste gases at solid fuel-fired plants on the installation does not exceed 2 on the Ringlemann chart. (1)(2)(3)</p> <p>Verify that the plume opacity on the Bacharach scale of waste gases at liquid fuel-fired plants does not exceed:</p> <ul style="list-style-type: none"> <li>- 2 at diesel fuel-fired plants</li> <li>- 3 at no. 4 and 5 fuel oil-fired plants</li> <li>- 4 at no. 6 fuel oil-fired plants.</li> </ul> <p>(NOTE: Plume opacity limits for plants constructed and set in operation before 17 May 1985 are found by adding 1 to the limits stated above.)</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:										
<p><b>1-21.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards for emissions of dust in waste gases if the permit does not stipulate standards (Air Quality Protection Regulation, Section 2, Article 7, para 2).</p> <p style="text-align: center;">...</p>	<p>Verify that dust emission caused by the gases discharged from filling, separating, sifting, transporting, crushing and grinding plants do not exceed: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- 300 mg/m<sup>3</sup> if the emissions are 3 kg/h or less</li> <li>- 150 if the emissions are more than 3 kg/h.</li> </ul> <p>Verify that emissions of dusts not covered above do not exceed the limits given in Table 1-6.</p> <p>Verify that emissions of the dusts listed in Table 1-7 are kept within the following limits:</p> <table border="0" style="margin-left: 40px;"> <tr> <td>- Class I dust emissions (for emission flows of 0.1 kg or more)</td><td style="text-align: right;">20 mg/m<sup>3</sup></td></tr> <tr> <td>- Class II dust emissions (for emission flows of 1 kg or more)</td><td style="text-align: right;">50 mg/m<sup>3</sup></td></tr> <tr> <td>- Class III dust emissions (for emission flows of 3 kg or more)</td><td style="text-align: right;">75 mg/m<sup>3</sup></td></tr> <tr> <td>- Classes I and II occurring together</td><td style="text-align: right;">50 mg/m<sup>3</sup></td></tr> <tr> <td>- Classes I, II and III occurring together</td><td style="text-align: right;">75 mg/m<sup>3</sup></td></tr> </table> <p style="text-align: center;">...</p>	- Class I dust emissions (for emission flows of 0.1 kg or more)	20 mg/m <sup>3</sup>	- Class II dust emissions (for emission flows of 1 kg or more)	50 mg/m <sup>3</sup>	- Class III dust emissions (for emission flows of 3 kg or more)	75 mg/m <sup>3</sup>	- Classes I and II occurring together	50 mg/m <sup>3</sup>	- Classes I, II and III occurring together	75 mg/m <sup>3</sup>
- Class I dust emissions (for emission flows of 0.1 kg or more)	20 mg/m <sup>3</sup>										
- Class II dust emissions (for emission flows of 1 kg or more)	50 mg/m <sup>3</sup>										
- Class III dust emissions (for emission flows of 3 kg or more)	75 mg/m <sup>3</sup>										
- Classes I and II occurring together	50 mg/m <sup>3</sup>										
- Classes I, II and III occurring together	75 mg/m <sup>3</sup>										
<p><b>1-22.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards if the permit does not stipulate standards for the release of dusty gases during the production, crushing, classification and loading of dusty materials or other process involving such materials (Air Quality Protection Regulation, Section 2, Article 7, para 4).</p> <p style="text-align: center;">...</p>	<p>Verify that dusty gases released during the processing of dusty materials are collected and passed through a dust extractor system. (1)(2)(3)</p> <p>Verify that if dust leakage from machines producing products of less than 5 mm in diameter cannot be prevented, the production is carried out in an enclosed area.</p> <p style="text-align: center;">...</p>										
<p><b>1-23.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards if the permit does not stipulate standards for the storage of dusty materials in the open (Air Quality Protection Regulation, Section 2, Article 7, para 5).</p>	<p>Verify that appropriate measures are taken to protect the air quality from the effects of dusty materials stored in the open, including such measures as: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- construction of windbreaks or earth mounds, or the planting of trees as a wind barrier</li> <li>- enclosure of conveyor belts and other transporters</li> <li>- loading and unloading without scattering</li> <li>- covering materials with a layer of canvas or plastic, or with material the particles of which are larger than 10 mm in diameter</li> <li>- compacting dusty materials with binding materials</li> <li>- maintaining 10 percent moisture content on the outer surface.</li> </ul>										

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>1-24.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards if the permit does not stipulate standards for the transportation and storage of dust-producing combustion and manufacturing wastes (Air Quality Protection Regulation, Section 2, Article 7, para 6).</p> <p style="text-align: center;">...</p>	<p>Verify that enclosed transportation is used for materials that are not sufficiently moist to prevent production of dust during transportation. (1)(2)(3)</p> <p>Verify that measures such as those listed in the previous protocol are used for the storage of dust-producing combustion and manufacturing wastes.</p> <p>Verify that the areas where the storage operation is completed are covered with earth and that an effort is made to create a green area.</p> <p style="text-align: center;">...</p>
<p><b>1-25.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards if the permit does not stipulate standards concerning the condition of access roads (Air Quality Protection Regulation, Section 2, Article 7, para 7).</p> <p style="text-align: center;">...</p>	<p>Verify that one or more of the following measures are taken with regard to access roads on the installation: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- paving with concrete or a similar materials</li> <li>- regular cleaning</li> <li>- treatment with dust-collecting substances.</li> </ul> <p style="text-align: center;">...</p>
<p><b>1-26.</b> Industrial plants that are required to have a permit under Articles 10 through 28, must meet specific standards if the permit does not stipulate standards concerning the emptying of dust-control filters (Air Quality Protection Regulation, Section 2, Article 7, para 8).</p> <p style="text-align: center;">...</p>	<p>Verify that the dust from filters is either emptied into an enclosed system or moistened during emptying. (1)(2)(3)</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>FURNACES AND BOILERS</b></p> <p>1-27. Dust emissions and emissions of specific compounds from solid fuel-fired furnaces and boilers are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.1.1).</p>	<p>Verify that the plume opacity of waste gases does not exceed 2 on the Ringlemann chart or at most 3 at old plants with a fuel thermal power of 150 kW or less. (1)(2)(3)(8)</p> <p>Verify that at manually loaded installations with a fuel thermal power of 150 - 600 kW dust emissions in the flue gas do not exceed 150 mg/m<sup>3</sup> at new plants and at most 200 mg/m<sup>3</sup> at old plants.</p> <p>Verify that at mechanically loaded plants with a fuel thermal power of 5-150 kW dust emissions in the flue gas do not exceed 350 mg/m<sup>3</sup> at new plants and at most 450 mg/m<sup>3</sup> at old plants.</p> <p>Verify that at plants with a fuel thermal power of up to 15 MW dust emission do not exceed 200 mg/m<sup>3</sup> at new plants and at most 250 mg/m<sup>3</sup> at old plants.</p> <p>Verify that at plants with a fuel thermal power of more than 50 MW dust emissions do not exceed 150 mg/m<sup>3</sup> at new plants and at most 250 mg/m<sup>3</sup> at old plants.</p> <p>(NOTE: At plants with fuel thermal power of 15 to 50 MW, dust emissions are found by linear interpolation among the values corresponding to 15 to 50 MW.)</p> <p>(NOTE: The Prime Ministry General Directorate of Environment may increase the dust emission limits given above by 200 percent if operations require the use of lignite with an ash content of more than 18 percent.)</p> <p>Verify that at new plants with a fuel thermal power over 50 MW fired by solid fuels other than coal and wood, the emission of the following pollutants does not exceed 0.5 mg/m<sup>3</sup>:</p> <ul style="list-style-type: none"> <li>- arsenic</li> <li>- cadmium</li> <li>- cobalt</li> <li>- lead</li> <li>- nickel</li> <li>- compounds of these elements.</li> </ul> <p>Verify that at old plants with a fuel thermal power over 50 MW fired by solid fuels other than coal and wood, the emission of the following pollutants does not exceed 1.5 mg/m<sup>3</sup>:</p> <ul style="list-style-type: none"> <li>- arsenic</li> <li>- cadmium</li> <li>- cobalt</li> <li>- lead</li> <li>- nickel</li> <li>- compounds of these elements.</li> </ul>

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:										
<p><b>1 - 27 (continued)</b></p> <p>...</p> <p><b>1-28.</b> The emission of nitrogen oxides from solid fuel-fired furnaces with a capacity of 50 MW and greater is subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.1.2).</p> <p>...</p> <p><b>1-29.</b> The emission of halogen compounds from solid fuel-fired furnaces and boilers is subject to specific limits based on the capacity of the furnace or boiler (Air Quality Protection Regulation, Annex 7, Section 1.1.3).</p> <p>...</p>	<p>(NOTE: limit concentrations are determined on the basis of the amount of volumetric oxygen in flue gases:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Combustion system</th><th style="text-align: right;">Volumetric oxygen (percent)</th></tr> </thead> <tbody> <tr> <td>Wood and wood waste-fired boilers</td><td style="text-align: right;">13</td></tr> <tr> <td>Water-tube boilers with a large volume of water and a grate</td><td style="text-align: right;">7</td></tr> <tr> <td>Dry-ash water-tube boilers with coal dust combustion systems</td><td style="text-align: right;">6</td></tr> <tr> <td>Fused ash water-tube boilers with coal dust combustion systems</td><td style="text-align: right;">5)</td></tr> </tbody> </table> <p>(NOTE: These emissions limits also apply when soot blowers are in operation.)</p> <p>Verify that carbon monoxide in the flue gas does not exceed 250 mg/m<sup>3</sup>.</p> <p>...</p> <p>Verify that emissions of nitrogen monoxide and nitrogen dioxide for solid fuel-fired furnaces with a capacity of 50 MW and greater do not exceed 800 mg/m<sup>3</sup> at new plants and 1000 mg/m<sup>3</sup> at old plants when the amount of volumetric oxygen in the flue gas is assumed to be 5 percent (1)(2)(3)(8)</p> <p>Verify that at furnaces with a capacity of 50 MW and greater where anthracite dust is used as fuel and is burned leaving slag, emissions do not exceed:</p> <ul style="list-style-type: none"> <li>- at new plants, 1800 mg/m<sup>3</sup></li> <li>- at old plants, 200 mg/m<sup>3</sup></li> <li>- at old anthracite-fired dry ash plants, 1300 mg/m<sup>3</sup>.</li> </ul> <p>...</p> <p>Verify that emissions of halogen compounds from furnaces with more than 300 MW capacity do not exceed: (1)(2)(3)(8)</p> <ul style="list-style-type: none"> <li>- gaseous inorganic chlorine compounds as hydrogen chloride: 100 mg/m<sup>3</sup></li> <li>- gaseous inorganic fluorine compounds as hydrogen fluoride: 15 mg/m<sup>3</sup>.</li> </ul> <p>Verify that emissions of halogen compounds from plants with a fuel thermal power of 50 to 300 MW do not exceed:</p> <ul style="list-style-type: none"> <li>- gaseous inorganic chlorine compounds: 200 mg/m<sup>3</sup></li> <li>- gaseous inorganic fluorine compounds: 30 mg/m<sup>3</sup>.</li> </ul> <p>...</p>	Combustion system	Volumetric oxygen (percent)	Wood and wood waste-fired boilers	13	Water-tube boilers with a large volume of water and a grate	7	Dry-ash water-tube boilers with coal dust combustion systems	6	Fused ash water-tube boilers with coal dust combustion systems	5)
Combustion system	Volumetric oxygen (percent)										
Wood and wood waste-fired boilers	13										
Water-tube boilers with a large volume of water and a grate	7										
Dry-ash water-tube boilers with coal dust combustion systems	6										
Fused ash water-tube boilers with coal dust combustion systems	5)										

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>1-30.</b> The emission of sulfur dioxide from new solid fuel-fired furnaces must meet specific requirements (Air Quality Protection Regulation, Annex 7, Section 1.1.4).</p> <p style="text-align: center;">...</p>	<p>Verify that emissions of sulfur dioxide in flue gases of new solid fuel-fired furnaces do not exceed: (1)(2)(3)(8)</p> <ul style="list-style-type: none"> <li>- at dust-burning plants with grates having a fuel thermal power up to 300 MW (assuming volumetric oxygen in flue gas to be 5 percent): 2000 mg/m<sup>3</sup></li> <li>- at fluid-bed plants with a fuel thermal power of up to 300 MW (assuming volumetric oxygen in flue gas to be 5 percent): 400 mg/m<sup>3</sup></li> <li>- at plants with a thermal power of 300 MW or more (assuming volumetric oxygen in flue gas to be 5 percent): 1000 mg/m<sup>3</sup>.</li> </ul> <p>Verify that if the limits on sulfur dioxide given above are exceeded, the facility makes an effort to remain within the limits by:</p> <ul style="list-style-type: none"> <li>- implementing a sulfur retention process either before, during or after combustion in order to reduce sulfur emissions by 10 percent at facilities with a fuel thermal power up to 300 MW or by 5 percent at facilities with a thermal power of over 300 MW</li> <li>- at plants which still cannot meet the limits stated above, implementing desulfurization.</li> </ul> <p>(NOTE: If a plant is unable within a definite period of time to obtain coal with the sulfur content envisaged in the design, and if stack height has been calculated on the basis of this sulfur content, permission may be granted for sulfur oxide emissions up to 2,500 mg/m<sup>3</sup>, for no more than six months.)</p> <p>(NOTE: If the treatment plant for reducing sulfur oxide emissions at a furnace or boiler breaks down, permission may be granted to operate for 72 consecutive h or for a total of no more than 240 h in a calendar year, provided that the situation is reported to the relevant parties.)</p> <p style="text-align: center;">...</p>
<p><b>1-31.</b> Emissions of sulfur oxides from old solid fuel-fired or old liquid fuel fired furnaces and boilers are required to meet specific standards (Air Quality Protection Regulation, Annex 7, Section 1.5)</p> <p style="text-align: center;">...</p>	<p>Verify that at old solid fuel-fire or liquid-fuel fired furnaces and boilers, emissions do not exceed 3200 mg/m<sup>3</sup> at plants with remaining life of 20,000 to 50,000 h. (1)(2)(3)(8)</p> <p>(NOTE: There is no new emission limit for plants with a maximum remaining life of 20,000 h, regardless of size.)</p> <p style="text-align: center;">...</p>

**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>1-32.</b> Dust emissions from liquid fuel-fired furnaces and boilers are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.2.1.)</p> <p style="text-align: center;">...</p>	<p>Verify that at diesel fuel-fired plants with a thermal power up to 2 MW the degree of sootiness on the Bacharach scale does not exceed 2 at new plants or 3 at old plants. (1)(2)(3)(8)</p> <p>Verify that at plants burning no. 4 or 5 fuel the degree of sootiness on the Bacharach scale does not exceed 3 at new plants or 4 at old plants.</p> <p>Verify that at plants burning no. 6 motor oil the degree of sootiness on the Bacharach scale does not exceed 4 at new plants and 5 at old plants.</p> <p>Verify that dust emissions in the flue gases of plants with a thermal power of more than 2 MW do not exceed the limits given in Table 1-8, assuming volumetric oxygen to be 3 percent.</p> <p>Verify that dust emissions in the form of arsenic, lead, cadmium, chromium, cobalt, nickel, and their compounds do not exceed 2 mg/m<sup>3</sup>.</p> <p style="text-align: center;">...</p>
<p><b>1-33.</b> Emissions of carbon monoxide from liquid fuel-fired plants are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.2.2).</p> <p style="text-align: center;">...</p>	<p>Verify that emissions of carbon monoxide do not exceed 175 mg/m<sup>3</sup>, assuming 3 percent volumetric oxygen. (1)(2)(3)(8)</p> <p style="text-align: center;">...</p>
<p><b>1-34.</b> Emissions of nitrogen oxides from liquid fuel-fired plants with a thermal power of 50 MW or greater are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.2.3).</p> <p style="text-align: center;">...</p>	<p>Verify that emissions of NO and NO<sub>2</sub> (as NO<sub>2</sub>) in the flue gases at new plants with a thermal power of 50 MW or more, with an assumed volumetric oxygen of 3 percent do not exceed 800 mg/m<sup>3</sup>. (1)(2)(3)(8)</p> <p>Verify that emissions in the flue gases of old plants with a thermal power of 50 MW or more, with an assumed volumetric oxygen of 3 percent, do not exceed 200 mg/m<sup>3</sup>.</p> <p>(NOTE: Emissions of nitrogen oxides should be lowered by such techniques as lowering flame temperature by means of flue gas feedback or secondary air combustion.)</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS												
<p><b>1-35.</b> Emissions of sulfur oxides from new liquid fuel-fired plants are subject to specific limits based on capacity (Air Quality Protection Regulation, Annex 7, Section 1.2.4).</p> <p>...</p>	<p>Verify that the proportion of SO<sub>2</sub> and SO<sub>3</sub> (given as equivalent SO<sub>2</sub>) in the flue gases, assuming volumetric oxygen of 3 percent, do not exceed: (1)(2)(3)(8)</p> <ul style="list-style-type: none"><li>- at plants with a thermal power of up to 300 MW: 1700 mg/m<sup>3</sup></li><li>- at plants with a thermal power of more than 300 MW: 800 mg/m<sup>3</sup>.</li></ul> <p>Verify that if these limits are exceeded, the facility is prepared to make an effort to stay within the limits by using a sulfur purification plant to reduce the degree of sulfur emissions by 10 percent at plants with a thermal power up to 300 MW and by 5 percent at plants with a larger thermal power.</p> <p>Verify that if the facility still cannot meet the standards, purification plants are operated to keep the degree of sulfur emissions to a maximum of 10 percent at plants with a thermal power of up to 300 MW and to a maximum of 5 percent at larger plants.</p> <p>(NOTE: If a plant is unable within a definite period of time to obtain fuel oil with the sulfur content envisaged in the design, and if stack height is suitable, permission may be granted for sulfur oxide emissions up to 3,400 mg/m<sup>3</sup>, for no more than six months.)</p> <p>(NOTE: If a purification plant for reducing sulfur oxide emissions to the above limits breaks down, permission may be granted to operate for 72 consecutive h or for a total of no more than 240 h in a calendar year.)</p> <p>...</p>												
<p><b>1-36.</b> Emissions of dust, sulfur dioxide, carbon monoxide, and aldehyde from gaseous fuel-fired furnaces and boilers with a thermal power less than 100 MW are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.3(a)).</p> <p>...</p>	<p>Verify that emissions of dust from gaseous fuel-fired furnaces and boilers with a thermal power of less than 100 MW do not exceed 10 mg/m<sup>3</sup>. (1)(2)(3)(8)</p> <p>Verify that emissions of gaseous pollutants from gaseous fuel-fired furnaces and boilers with a thermal power of less than 100 MW do not exceed the following limits:</p> <table><tr><th>Fuel used</th><th>Carbon monoxide mg/m<sup>3</sup></th><th>Sulfur dioxide mg/m<sup>3</sup></th><th>Aldehyde (as formaldehyde) mg/m<sup>3</sup></th></tr><tr><td>Natural gas</td><td>100</td><td>100</td><td>20</td></tr><tr><td>Coke producer gas</td><td>200</td><td>100</td><td>20</td></tr></table> <p>...</p>	Fuel used	Carbon monoxide mg/m <sup>3</sup>	Sulfur dioxide mg/m <sup>3</sup>	Aldehyde (as formaldehyde) mg/m <sup>3</sup>	Natural gas	100	100	20	Coke producer gas	200	100	20
Fuel used	Carbon monoxide mg/m <sup>3</sup>	Sulfur dioxide mg/m <sup>3</sup>	Aldehyde (as formaldehyde) mg/m <sup>3</sup>										
Natural gas	100	100	20										
Coke producer gas	200	100	20										

**COMPLIANCE CATEGORY:  
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REGULATORY REQUIREMENTS	REVIEWER CHECKS:						
<p><b>1-37.</b> Emissions of dust, sulfur dioxide, carbon monoxide, and aldehyde from gaseous fuel-fired furnaces and boilers with a thermal power of 100 MW or more are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.3(b)).</p> <p style="text-align: center;">...</p> <p><b>1-38.</b> Emissions of pollutants at dual-fuel-fired furnaces and boilers are subject to specific limits (Air Quality Protection Regulation, Annex 7, Section 1.4).</p> <p style="text-align: center;">...</p>	<p>Verify that emissions of gaseous pollutants from gaseous fuel-fired furnaces and boilers with a thermal power of 100 MW or more do not exceed the following limits: (1)(2)(3)(8)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Carbon monoxide</td><td style="width: 50%; text-align: right;">100 mg/m<sup>3</sup></td></tr> <tr> <td>Nitrogen oxides</td><td style="text-align: right;">500 mg/m<sup>3</sup></td></tr> <tr> <td>Sulfur oxides</td><td style="text-align: right;">60 mg/m<sup>3</sup></td></tr> </table> <p style="text-align: center;">...</p> <p>Determine the percent of total heat energy supplied for each fuel type used at a dual-fuel-fired furnace or boiler. (1)(2)(3)(8)</p> <p>Verify that if one fuel type supplies more than 90 percent of the heat energy, the emissions from the plant comply with the limits for that fuel.</p> <p>Verify that if no fuel type supplies 90 percent of the heat energy, the emissions from the plant comply with a weighted average of the limits for each fuel based on the proportion of heat energy supplied by each.</p> <p style="text-align: center;">...</p>	Carbon monoxide	100 mg/m <sup>3</sup>	Nitrogen oxides	500 mg/m <sup>3</sup>	Sulfur oxides	60 mg/m <sup>3</sup>
Carbon monoxide	100 mg/m <sup>3</sup>						
Nitrogen oxides	500 mg/m <sup>3</sup>						
Sulfur oxides	60 mg/m <sup>3</sup>						
<p style="text-align: center;"><b>INCINERATORS</b></p> <p><b>1-39.</b> The operation of household and similar waste incinerators is subject to specific requirements (Air Quality Protection Regulation, Annex 7, Section 2.1.1(a) through 2.1.1(d)).</p> <p style="text-align: center;">...</p>	<p>Verify that incinerators with a mass transfer capacity of 0.75 tons/h where mainly household and extremely foul-smelling wastes are incinerated, have garbage bunkers whose internal pressure is always less than atmospheric pressure. (1)(2)(3)</p> <p>Verify that intake air is sent to the combustion chamber.</p> <p>Verify that if a continuously operating plant breaks down, the incoming air is discharged through a stack.</p> <p>Verify that in a plant that operates less than 24 h a day and is partially shutdown, the incoming air is ejected through the air while the plant is being shut down.</p> <p>Verify that liquid fuels, if they are burned along with solid fuels, are stored in closed containers.</p> <p>Verify that open-air conveyors are covered by an air-suction hood and that incoming air is sent to the combustion chamber.</p> <p>Verify that the plant is equipped with an auxiliary combustion system.</p> <p>Verify that the plant is connected to a stack.</p> <p style="text-align: center;">...</p>						

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**COMPLIANCE CATEGORY:  
AIR EMISSIONS MANAGEMENT  
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REGULATORY REQUIREMENTS	REVIEWER CHECKS:												
1-40. The operation of afterburners in household and similar waste incinerators is subject to specific requirements (Air Quality Protection Regulation, Annex 7, Section 2.1.1(e))	Verify that any household and similar waste incinerator on the installation has an afterburner connected to a combustion chamber. (1)(2)(3)												
	Verify that the temperature in the afterburner is continuously monitored and recorded.												
	Verify that temperature in the afterburner is kept a a minimum of 800 °C if the volumetric oxygen content of flue gas is 6 percent and the minimum retention period is 0.3 s.												
	Verify that the plant is designed to be loadable only when the temperature in the afterburner is 800 °C or higher, and that a combustion unit is automatically activated when the temperature in the afterburner falls below the minimum.												
	Verify that when a plant with a mass flow of .75 tons/h is not in operation, the incoming air from the garbage bunkers is ejected through an afterburner.												
...	...												
1-41. Emissions of air pollutants from household and similar waste incinerators are subject to specific limits (Air Quality Control Regulation, Annex 7, Section 2.1.1(f) through 2.1.1(n)).	Verify that waste gases and the malodorous substances carried by them undergo complete combustion. (1)(2)(3)												
	Verify that dust emissions in waste gases do not exceed 100 mg/m <sup>3</sup> .												
	Verify that volumetric oxygen in the flue gas does not exceed the following:												
	- 17 percent in the flue gas at plants with a mass flow of up to 0.75 tons/h												
	- 11 percent in flue gas at plants with mass flow of over 0.75 tons/h.												
	Verify that plume opacity on the Ringlemann chart is less than 1.												
	Verify that levels of inorganic gaseous emissions do not exceed the following limits, assuming that volumetric oxygen is 11 percent in emissions limits:												
	<table><tr><td>Mass garbage flow</td><td>Chlorine compounds</td><td>Fluorine compounds</td></tr><tr><td>in tons/h</td><td>as Cl<sup>-</sup></td><td>as F<sup>-</sup></td></tr><tr><td>up to 0.75</td><td>6 kg/h</td><td>0.2 kg/h</td></tr><tr><td>0.75 or more</td><td>100 mg/m<sup>3</sup></td><td>5 mg/m<sup>3</sup></td></tr></table>	Mass garbage flow	Chlorine compounds	Fluorine compounds	in tons/h	as Cl <sup>-</sup>	as F <sup>-</sup>	up to 0.75	6 kg/h	0.2 kg/h	0.75 or more	100 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
Mass garbage flow	Chlorine compounds	Fluorine compounds											
in tons/h	as Cl <sup>-</sup>	as F <sup>-</sup>											
up to 0.75	6 kg/h	0.2 kg/h											
0.75 or more	100 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>											
	Verify that plants with a mass garbage flow of 0.75 tons/h are equipped with a measuring device for continuously recording emissions of gaseous chlorine and fluorine compounds.												
	Verify that carbon monoxide emissions in waste gas do not exceed 1 g/m <sup>3</sup> .												
...	...												

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**COMPLIANCE CATEGORY:  
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<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>1-42.</b> The operation of waste incinerators other than household and similar waste incinerators is subject to specific requirements (Air Quality Protection Regulation, Annex 7, Section 2.2.1(a) through 2.2.1(c)).</p> <p style="text-align: center;">...</p>	<p>Verify that liquid wastes are stored in closed containers. (1)(2)(3)</p> <p>Verify that open storage compartments are provided with air suction hoods.</p> <p>Verify that incoming air is sent to the combustion chamber.</p> <p>Verify that no loading takes place if the combustion system is out of order.</p> <p>Verify that the plant is equipped with auxiliary furnaces.</p> <p>Verify that the plant has a stack.</p> <p style="text-align: center;">...</p>
<p><b>1-43.</b> The operation of afterburners in waste incinerators other than household and similar waste incinerators is subject to specific requirements (Air Quality Protection Regulation, Annex 7, Section 2.2.1(d))</p> <p style="text-align: center;">...</p>	<p>Verify that the plant has an afterburner connected to a combustion chamber. (1)(2)(3)</p> <p>Verify that the temperature in the afterburner is monitored continuously and recorded.</p> <p>Verify that temperature in the afterburner is kept at a minimum of 900 °C based on a minimum volumetric oxygen content of flue gas of 6 percent and a retention period of 0.3 s.</p> <p>Verify that the plant is designed to be loadable only when the temperature in the afterburner is 900 °C or higher, and that a combustion unit is automatically activated when the temperature in the afterburner falls below the minimum.</p> <p>Verify that a minimum temperature of 1200 °C is maintained during the incineration of substances containing PCBs.</p> <p>(NOTE: An afterburner is not required if proper combustion can be ensured in fluid-bed systems.)</p> <p style="text-align: center;">...</p>

**COMPLIANCE CATEGORY:  
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REGULATORY REQUIREMENTS	REVIEWER CHECKS:				
<p><b>1-44.</b> Emissions of air pollutants from waste incinerators other than household and similar waste incinerators are subject to specific limits (Air Quality Control Regulation, Annex 7, Section 2.2.1(e) through 2.2.1(l)).</p> <p style="text-align: center;">...</p> <p><b>1-45.</b> Dust emissions from garbage treatment plants, where garbage and waste are either incinerated, converted to compost, or stored, are subject to specific limitations (Air Quality Protection Regulation, Annex 7, Section 2.5.1).</p> <p style="text-align: center;">...</p> <p><b>AIR EMISSIONS ACCIDENTS</b></p> <p><b>1-46.</b> Emissions into the air in excess of the amounts envisaged during normal operations as a result of accidents must be corrected (Air Quality Protection Regulation, Section 4, Article 43).</p> <p style="text-align: center;">...</p>	<p>Verify that carbon emissions in waste gases do not exceed 50 mg/m<sup>3</sup>, assuming a volumetric oxygen of 11 percent. (1)(2)(3)</p> <p>Verify that dust emissions in waste gases do not exceed 100 mg/m<sup>3</sup>, assuming a volumetric oxygen of 11 percent.</p> <p>Verify that plume opacity on the Ringlemann chart is less than 1.</p> <p>(NOTE: The requirements for dust emissions and plume opacity also apply during periods when soot extractors are in operation.)</p> <p>Verify that carbon monoxide emissions in waste gases do not exceed 100 mg/m<sup>3</sup>, assuming a volumetric oxygen of 11 percent.</p> <p>Verify that levels of inorganic gaseous emissions do not exceed the following limits, assuming that volumetric oxygen is 11 percent in emissions limits:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Chlorine compounds (as Cl<sup>-</sup>)</td><td>100 mg/m<sup>3</sup></td></tr> <tr> <td>Fluorine compounds (as F<sup>-</sup>)</td><td>5 mg/m<sup>3</sup></td></tr> </table> <p>Verify that plants are equipped with a measuring device for continuously recording emissions of gaseous inorganic chlorine compounds (if chlorine compounds are burned) and dust emissions.</p> <p style="text-align: center;">...</p> <p>Verify that dust emissions from garbage treatment plants do not exceed 200 mg/m<sup>3</sup>. (1)(2)(3)</p> <p style="text-align: center;">...</p>	Chlorine compounds (as Cl <sup>-</sup> )	100 mg/m <sup>3</sup>	Fluorine compounds (as F <sup>-</sup> )	5 mg/m <sup>3</sup>
Chlorine compounds (as Cl <sup>-</sup> )	100 mg/m <sup>3</sup>				
Fluorine compounds (as F <sup>-</sup> )	5 mg/m <sup>3</sup>				
	<p>Verify that the plant is prepared to do whatever is necessary to reduce emissions to a normal level as soon as possible. (1)(2)(3)</p> <p style="text-align: center;">...</p>				

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<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>AIR QUALITY INSPECTORS</b></p> <p><b>1-47.</b> Operators of plants required to have a permit must appoint a sufficient number of air quality inspectors (Air Quality Protection Regulation, Section 7, Articles 57 through 58).</p> <p style="text-align: center;">...</p> <p><b>1-48.</b> The appointment of air quality inspectors is subject to specific requirements (Air Quality Protection Regulation, Section 7, Article 59).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation has appointed the number of air quality inspectors required by the Prime Ministry General Directorate of Environment or the Provincial Governor's Office, and given them authority to: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- monitor emissions from the plant and air quality standards</li> <li>- monitor technical problems posed by emission control</li> <li>- monitor products causing air pollution which could have harmful effects on the environment, even when used in accordance with their stated purposes</li> <li>- report any deficiencies to the plant manager</li> <li>- draw up proposals for eliminating such deficiencies, and to assist in ensuring that the conditions stipulated in the regulations are fulfilled</li> <li>- promote and develop processes, including those required for the appropriate use of waste substances, that are in harmony with the environment</li> <li>- promote and develop products including recycling and other uses, that are in harmony with the environment</li> <li>- submit annual reports to the plant manager.</li> </ul> <p style="text-align: center;">...</p> <p>Verify that the appointments of the air quality inspectors are made in writing, detailing the duties and responsibilities of each one. (1)(2)(3)</p> <p>Verify that the appointment of the air quality inspector is reported to the authorized official.</p> <p>Verify that the air quality inspector is directly subordinate to the plant manager.</p> <p>Verify that the air quality inspector is technically competent and reliable.</p> <p>Verify that the plant manager provides the necessary coordination for the air quality inspectors if more than one are appointed.</p> <p>Verify that the plant manager provides the auxiliary personnel and physical means to enable the air quality inspector to fulfill his or her responsibilities.</p> <p style="text-align: center;">...</p>



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<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>EMISSION MEASUREMENTS</b></p> <p><b>1-49.</b> The measurement and determination of air pollution levels is subject to specific requirements (Air Quality Protection Regulation, Section 2, Article 6, para 5).</p> <p style="text-align: center;">...</p> <p><b>1-50.</b> Plants suspected of creating harmful environmental effects may be required to measure emissions discharged by the plant and the quality of the ambient air (Air Quality Protection Regulation, Section 4, Articles 34 and 40).</p> <p style="text-align: center;">...</p> <p><b>1-51.</b> Operators of certain plants are required to submit emissions reports (Air Quality Protection Regulation, Section 4, Article 36).</p> <p style="text-align: center;">...</p>	<p>Verify that the measurement of air pollution levels is carried out in accordance with the methods given in Annex 2 of the Air Quality Protection Regulation. (1)(2)</p> <p>(NOTE: This measurement is not required if emissions from stacks do not exceed the values given in Table 1-9, and emissions from sources other than stacks do not exceed one tenth of the values given in Table 1-9.)</p> <p style="text-align: center;">...</p> <p>Verify that the installation is prepared to measure emissions discharged by plants and the quality of ambient air if required to do so by authorized officials. (1)(2)</p> <p>Verify that records of such measurements are preserved by the plant for at least five yr.</p> <p style="text-align: center;">...</p> <p>Determine whether any plants on the installation are: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- in areas designated as critical zones with serious air pollution, or</li> <li>- outside such zones but required by a competent authority to submit emissions reports.</li> </ul> <p>Verify that such plants submit an annual report to the appropriate authority showing the amount of emissions produced by the plant during a specific period and its distribution in time and space.</p> <p>(NOTE: The form and contents of the report, the date by which it must be submitted, and the methods to be used in measuring emissions are determined by the authorized official.)</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
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<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>VEHICLES</b></p> <p><b>1-52.</b> Emissions from vehicles are subject to specific restrictions (Air Quality Protection Regulation, Section 5, Article 47).</p>	<p>Verify that emissions from motorized land vehicles, railroads and seagoing vessels are kept below the limits specified in the Regulation on the Manufacture, Repair and Assembly of Vehicles enacted by the Ministry of Industry and Trade. (1)(5)(9)(10)</p> <p>Verify that the operation and technical inspection of land vehicles complies with regulations issued by the General Directorate of Highways of the Ministry of Public Works and Building.</p> <p>Verify that the operation and technical inspection of railroad vehicles and seagoing vessels complies with regulations issued by the Ministry of Transport.</p> <p>Verify that if no Turkish standard for emissions exists, vehicles comply with the relevant standards of the European Economic Community.</p>

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**Table 1-1**

**Types of Plants Requiring a Permit**

(Air Quality Protection Regulation, Annex 8)

**List A: Permission for the plants in this list shall be granted by the authorized official following consultation with the Prime Ministry General Directorate of Environment.**

- 1.1: Solid, liquid and gaseous fuel-fired thermal power plants, integrated thermal power plants, central heating plants:
  - a) Solid and liquid fuel-fired plants with a total combustion system thermal power of 20 MW or more.
  - b) Gaseous fuel-fired plants with a total combustion system thermal power of 40 MW or more.
- 1.2 Plants fired by the following fuels:
  - a) Plants fired by coal, coke, coal briquettes, peat, fuel oil, and untreated wood wastes not coated with plastic and chemical substances with a total combustion system thermal power of 20MW and higher.
  - b) Gaseous fuel-fired plants with a total combustion system thermal power of 40 MW or more.
- 1.3 Combustion plants fired by fuels other than those specified in paragraph 1.2 and with a total combustion system thermal power of 40 MW or higher.
- 1.5 Gas turbines used to drive generators and industrial machinery with an exhaust gas flow of 60,000 m<sup>3</sup>/h or higher by volume, excluding closed circuit gas turbines.
- 1.6 Cooling towers with a cooling water flow of 10,000 m<sup>3</sup>/h and higher.
- 1.7 Coal grinding and dehydrating plants with capacities of 30 tons/h or higher.
- 1.8 Lignite and anthracite briquetting plants
- 1.9 Dry distillation plants (coking, gasification, airborne particle extraction, etc.) using anthracite, lignite, wood, peat, thick tar and similar substances; excluding charcoal production
- 1.10 Plants for distilling and processing tar, tar products, and tar water or gas
- 1.11 Plants for producing generator and water gas from solid fuels
- 1.12 Plants for obtaining gaseous fuel from hydrocarbons by crushing
- 1.13 Coal gasification and liquefaction plants

**Table 1-1 (continued)**

**1.14 Plants using schist and other similar stones and sand to produce liquid fuel, and plants for the distillation and processing of such fuel**

**2. Stone, soil, glass, ceramic and construction materials**

**2.3 Cement and cement clinker producing plants**

**2.4 Bauxite, dolomite, plaster, lime, limestone, kieselguhr, magnesite, quartz or fireclay producing furnaces or firing plants**

**2.6 Asbestos producing, processing and shaping plants**

**2.7 Perlite, schist, and clay blasting installations**

**2.8 Glass plants, excluding plants producing glass from glass fragments and plants producing fiberglass and the glass fibers used in communications**

**2.10 Plants with a firing volume of 3 m<sup>3</sup> and up and with a loading density of 300 kg per cubic meter for firing clay ceramic products, excluding electrically heated production line-type plants which do not discharge waste gas**

**2.14 Plants with a production capacity of 5 tons/h and up for the production of materials formed by compression through impact, shaking or vibrating and using cement or other binding materials**

**2.15 Plants to be operated for more than one year for the preparation of road paving materials, including tar-melting and spraying plants, and plants for producing and melting bituminous or tar mixtures with mineral substances**

**3. Production and Processing of Steel, Iron, and Other Metals**

**3.1 Ore-roasting (oxidation by heating under exposure to air), melting and sintering (heating without melting to form a coherent mass) plants**

**3.2 Plants producing pig iron or non-ferrous metals**

**3.3 Steel producing plants and wrought iron or crude steel smelting plants, excluding wrought iron and steel smelting plants with smelting capacities up to 2.5 tons/h.**

**3.4 Smelting plants for zinc and zinc alloys with a capacity of 200 kg and up, or other non-ferrous metal smelting plants and refineries with a capacity of more than 500 kg, excluding the following:**

**-Vacuum smelting plants**

**-Smelters for tin and bismuth and cast alloys of refined zinc, aluminum or copper with low melting points**

**-Smelters which are part of die-casting or shell molding machines**

**-Smelters for noble metals or alloys consisting of only noble metals or of noble metals and copper**

**-Mixed soldering baths**

**3.5 Plants for cleaning steel surfaces, particularly ingots, bars, rods, sheets, etc. by flame**

**Table 1-1 (continued)**

**3.6 Rolling mills, excluding the following:**

- Cold process rolling mills with a roller width of up to 650 mm.
- Rolling mills with a capacity of less than 8 tons/h for heavy non-ferrous metals, and plants with a capacity of less than 2 tons/h for light non-ferrous metals

**3.7 Iron, temper and steel foundries, excluding plants with a monthly capacity of less than 800 tons where molds and core iron are produced by the cold process**

**3.8 Foundries where non-ferrous metals are cast, excluding the following:**

- Foundries where pieces are cast for artwork
- Foundries where casting is done using metal molds
- Foundries where metals are melted in movable crucibles
- Foundries where traction units are manufactured from casting alloys with low melting points such as those specified in article 3.4

**3.9 Plants with a plating capacity of 1 ton/h or greater where metal surfaces are plated with protective coverings like lead, tin or zinc, either in a melting bath or by flame spraying, excluding permanent zinc plating plants using the Sendzimir process**

**3.11 Machine-driven installations with one or more pile drivers and a unit impact of 1 kJ and up**

**3.13 Plants where detonation molding and metal plating are done using explosives**

**3.14 Scrap metal crushing plants with small rotary mills with capacities of 500 kW and up**

**3.16 Plants producing seamless and welded steel pipes by the hot casting method**

**3.18 Plants producing metal ship frames and ship compartments of 20 m or more in length**

**3.20 Plants producing 1500 or more lead batteries and industrial battery cells per day**

**3.22 Plants, excluding those mentioned in 3.21, producing aluminum, iron or magnesium dust or nickel-containing dust or strands**

**4. Chemicals, Pharmaceuticals, Refining and Processing of Mineral Oils**

**4.1 Plants where the following substances in particular are industrially produced by chemical conversion:**

- a) Plants where inorganic chemicals such as acids, bases and salts are produced
- b) Plants where metals and non-metallic substances are produced by the wet process or using electrical energy
- c) *Corendon* or carbide producing plants
- d) Plants producing halogens or halogen products and sulfur or sulfur products
- e) Plants producing phosphorus or nitrogen-base fertilizers

**Table 1-1 (continued)**

- f) Plants where pressure-soluble acetylenes are produced (*Dissous* gas factories)
  - g) Plants producing organic chemicals and solvents such as alcohols, aldehydes, ketones, acids, esters, acetates and ethers, excluding plants where nuclear fuel is produced or broken down or plants where used nuclear fuels are reprocessed
  - h) Plastics and chemic fibers plants
  - i) Cellulose nitrate plants
  - j) Synthetic resin plants
  - k) Hydrocarbon plants
  - l) Synthetic rubber plants
  - m) Plants for chemical regeneration of rubber and rubber products
  - n) Plants producing tar dyes and tar dye by-products
  - o) Soap and detergent plants with a capacity of more than 1 ton/day
- 4.4 Plants where mineral oils, old oils or lubricants are produced by the distillation, refining or other treatment of oil and petroleum products
- 4.5 Plants where lubricants such as lubricating liquids, lubricating oils and metal processing oils are produced
- 4.6 Soot producing plants
- 4.7 Plants producing carbon (hard coal) or plants producing electrographite for electrodes or electrical appliance parts, etc.
- 4.8 Plants with distillation capacities of ton/h and up for the production of organic solvents by distillation
- 4.9 Natural resin melting plants with capacities of 1 ton/day and up
5. Treatment of Surfaces with Organic Substances, Production of Plastic Profiles, Other Forms of Processing Plastics and Resins
- 5.1 Plants where substances are polished and dried in the form of profiles and sheets
- a) Plants with capacities of 250 kg/h and up for polishes containing organic solvents
- 5.2 Plants where profiles and sheets are pressed in rotary presses and then dried
- Dyes and polishes:
- a) Plants using only ethanol-base organic solvents at rates of 500 kg/h and up
  - b) Plants using other organic solvents at rates of 250 kg/h and up

**Table 1-1 (continued)**

**5.3 Plants where glass fiber, mineral fiber or materials in the form of profiles or sheets are plated, impregnated or filled with a chemical layer and then dried**

- a) Where chemical substances, synthetic resins, or
- b) Plastic and rubber solvents are used at a rate of 250 kg/h and up

**5.4 Plants where materials and tools are coated or filled with tar, tar oil or hot bitumen, excluding plants for filling and insulating cables with hot bitumen**

**5.5 Plants for insulating wires with phenols or cresol resin**

**5.6 Plants for coating tape materials with plastics and for drying mixtures of plastics, softeners, oxidized linseed oil and other substances**

## **6. Wood and Cellulose**

**6.1 Plants for the production of cellulose from wood, stems, straw and similar fibrous materials**

**6.2 Plants where one or more paper machines are used, where the length of paper roll between the paper outlet and the cylinder is 75 m or more**

## **7. Foodstuffs, Beverages, Feed and Agricultural Products**

### **7.2 Slaughterhouses**

- a) Plants where 5000 kg and up of live chickens are slaughtered per week
- b) Plants where 40,000 kg of other live animals are slaughtered per week

**7.3 Plants where animal fats are melted down, excluding plants with up to 200 kg weekly processing capacity**

**7.7 Plants for the production of gelatine and glue from slaughterhouse wastes**

**7.8 Plants for the production of feed, fertilizer and technical oils from bone, hair, wool, horn, hoof, blood and similar slaughterhouse wastes**

**7.9 Plants where processed animal hides and hair, other than wool, are stored and processed, excluding animal hairs not mentioned in 7.2 and used only for the processor's needs**

**7.10 Plants for storage of unprocessed bones, excluding:**

- Butchers with a weekly meat capacity of less than 4000 kg
- Plants not mentioned in 7.2

**7.11 Plants for the removal of animal carcasses and plants where animal organs or animal products are stored for removal to disposal plants**

**7.17 Meal and feed grinding plants with daily capacity of 500 tons and up**

**7.19 Sugar factories**

**Table 1-1 (continued)**

**7.26 Vegetable oil factories**

**8. Use and Disposal of Wastes**

**8.1 Incinerators with a combustion capacity of 750 kg/h and up for partial or complete disposal of solid and liquid substances by incineration. If plants for the disposal of halogenated hydrocarbons are to be operated for up to six months following startup in the same place, permission is required**

**8.2 Pyrolysis plants where combustible solids and liquids are subjected to thermal breakdown under insufficient oxygen**

**8.3 Plants for the recovery of certain solids by combustion**

**9. Storage, Filling, and Emptying of Materials**

**9.1 Storage plants with capacities of 30 tons and up for inflammable gases**

**9.2 Storage facilities with capacities of 50,000 tons and up for methanol recovered from mineral oils, liquid mineral oil products and other substances**

**9.3 Storage facilities with a capacity of 5000 tons and up for acryl nitrile**

**9.4 Storage facilities with a capacity of 200 tons and up for chlorine**

**9.5 Storage facilities with a capacity of 500 tons and up for sulfur dioxide**

**9.6 Storage facilities with a capacity of 2000 tons and up for liquid oxygen**

**9.7 Storage facilities with a capacity of 5000 tons and up for ammonium nitrate**

**9.8 Storage facilities with a capacity of 250 tons and up for sodium chlorate**

**9.10 Solid waste treatment plants with capacities of 100 tons/day and up**

**10. Others**

**10.1 Plants for the production, processing, recovery and/or disposal of explosive substances**

**10.2 Celluloid plants**

**10.3 Plants for the production of additives for varnish and spray paints using nitrocellulose with a nitrogen content of up to 12.6%**

**10.4 Natural asphalt melting and distilling plants**

**10.5 Pitch vaporizing plants**



**Table 1-1 (continued)**

**List B: Permission for the plants in this list shall be granted by the authorized official following consultation with the Local Environment Board**

**1. Heat Production, Mining, Energy**

**1.1 Solid, liquid and gaseous fuel-fired thermal power plants, integrated thermal power plants, central heating plants:**

- a) Solid and liquid fuel-fired plants with a total combustion system thermal power of 20 MW or more.**
- b) Gaseous fuel-fired plants with a total combustion system thermal power of 40 MW or more.**

**1.2 Plants fired by the following fuels:**

- a) Plants fired by coal, coke, coal briquettes, peat, fuel oil, and untreated wood wastes not coated with plastic and chemical substances with a total combustion system thermal power of 20MW and higher.**
- b) Gaseous fuel-fired plants with a total combustion system thermal power of 40 MW or more.**

**1.3 Combustion plants fired by fuels other than those specified in paragraph 1.2 and with a total combustion system thermal power of 40 MW or higher**

**1.5 Gas turbines used to drive generators and industrial machinery with an exhaust gas flow of 60,000 m<sup>3</sup>/h or higher by volume, excluding closed-circuit gas turbines**

**1.6 Cooling towers with a cooling water flow of 10,000 m<sup>3</sup>/h and higher**

**1.7 Coal grinding and dehydrating plants with capacities of 30 tons/h or higher**

**1.8 Lignite and anthracite briquetting plants**

**1.9 Dry distillation plants (coking, gasification, airborne particle extraction, etc.) using anthracite, lignite, wood, peat, thick tar and similar substances, excluding charcoal production**

**1.10 Plants for distilling and processing tar, tar products, and tar water or gas**

**1.11 Plants for producing generator and water gas from solid fuels**

**1.12 Plants for obtaining gaseous fuel from hydrocarbons by crushing**

**1.13 Coal gasification and liquefaction plants**

**1.14 Plants using schist and other similar stones and sand to produce liquid fuel, and plants for the distillation and processing of such fuel**

**2. Stone, soil, glass, ceramic and construction materials**

**2.3 Cement and cement clinker producing plants**

**Table 1-1 (continued)**

- 2.4 Bauxite, dolomite, plaster, lime, limestone, kieselguhr, magnesite, quartz or fireclay producing furnaces or firing plants
- 2.6 Asbestos producing, processing and shaping plants
- 2.7 Perlite, schist, and clay blasting installations
- 2.8 Glass plants, excluding plants producing glass from glass fragments and plants producing fiber glass and the glass fibers used in communications
- 2.10 Plants with a firing volume of 3 m<sup>3</sup> and up and with a loading density of 300 kg per cubic meter for firing clay ceramic products. Excluding electrically heated production line-type plants which do not discharge waste gas.
- 2.14 Plants with a production capacity of 5 tons/h and up, for the production of materials formed by compression through impact, shaking or vibrating and using cement or other binding materials.
- 2.15 Plants to be operated for more than one year for the preparation of road paving materials, including tar-melting and spraying plants, and plants for producing and melting bituminous or tar mixtures with mineral substances

### **3. Production and Processing of Steel, Iron, and Other Metals**

- 3.1 Ore-roasting (oxidation by heating under exposure to air), melting and sintering (heating without melting to form a coherent mass) plants
- 3.2 Plants producing pig iron or non-ferrous metals
- 3.3 Steel producing plants and wrought iron or crude steel smelting plants, excluding wrought iron and steel smelting plants with smelting capacities up to 2.5 tons/h.
- 3.4 Smelting plants for zinc and zinc alloys with a capacity of 200 kg and up, or other non-ferrous metal smelting plants and refineries with a capacity of more than 500 kg, excluding the following:
  - Vacuum smelting plants
  - Smelters for tin and bismuth and cast alloys of refined zinc, aluminum or copper with low melting points
  - Smelters which are part of die-casting or shell molding machines
  - Smelters for noble metals or alloys consisting of only noble metals or of noble metals and copper
  - Mixed soldering baths
- 3.5 Plants for cleaning steel surfaces, particularly ingots, bars, rods, sheets, etc. by flame
- 3.6 Rolling mills, excluding the following:
  - Cold process rolling mills with a roller width of up to 650 mm.
  - Rolling mills with a capacity of less than 8 tons/h for heavy non-ferrous metals, and plants with a capacity of less than 2 tons/h for light non-ferrous metals

**Table 1-1 (continued)**

**3.7 Iron, temper and steel foundries, excluding plants with a monthly capacity of less than 800 tons where molds and core iron are produced by the cold process**

**3.8 Foundries where non-ferrous metals are cast, excluding the following:**

- Foundries where pieces are cast for artwork
- Foundries where casting is done using metal molds
- Foundries where metals are melted in movable crucibles
- Foundries where traction units are manufactured from casting alloys with low melting points such as those specified in article 3.4

**3.9 Plants with a plating capacity of 1 ton/h or greater where metal surfaces are plated with protective coverings like lead, tin or zinc either in a melting bath or by flame spraying, excluding permanent zinc plating plants using the Sendzimir process**

**3.11 Machine-driven installations with one or more pile drivers and a unit impact of 1 kJ and up**

**3.13 Plants where detonation molding and metal plating are done using explosives**

**3.14 Scrap metal crushing plants with small rotary mills with capacities of 500 kW and up**

**3.15 Plants where the following machines are produced and repaired:**

- Boilers
- Vessels and tanks made of sheet iron with a volume of 5 m<sup>3</sup> and up
- Containers with a bottom surface of 7 m<sup>2</sup> or more

**3.17 Plants for production of seamless and welded steel pipes by the cold method**

**3.19 Plants where the surfaces of steel structure constructions, steel constructions and sheets are treated with sprayed materials, excluding enclosed plants where the sprayed substances are confined**

**3.22 Metal dust and strand producing plants other than the cold-method ones mentioned in 3.21**

#### **4. Chemicals, Pharmaceuticals, Refining and Processing of Mineral Oils**

**4.2 Plants where plant pesticides and insecticides and the active ingredients used in them are ground, mechanically mixed, packaged or repackaged**

**4.3 Pharmaceutical plants where drugs and/or their by-products are manufactured**

- a) Facilities where whole plants, plant parts and other plant substances are extracted, distilled, or similarly treated, excluding unheated ethanol extraction facilities
- b) Pharmaceutical plants where animal substances, live and dead animal organs and digestive products are added to drugs and their by-products
- c) Pharmaceutical plants where drugs and their by-products are manufactured by the addition of microorganisms, and substances consisting of them are added

**Table 1-1 (continued)**

- 4.8 Plants with distillation capacities of 0.5-1 ton/h for the production of organic solvents by distillation
- 4.9 Plants with capacities of 1 ton/day and up for melting synthetic resins
- 4.10 Plants with production capacities of 1 ton/day for the production of varnishes, polishes and spray paints
- 5. Treatment of Surfaces with Organic Substances, Production of Plastic Profiles, Other Forms of Processing Plastics and Resins
  - 5.1 Plants where substances are polished and dried in the form of profiles and sheets
    - Plants with capacities of 25 kg-250 kg/h for polishes containing organic solvents
  - 5.2 Plants where profiles and sheets are pressed in rotary presses and then dried
    - Dyes and polishes:
      - a) Plants using only ethanol-base organic solvents at rates of 50-500 kg/h
      - b) Plants using other organic solvents at rates of 25-250 kg/h
  - 5.3 Plants for coating or impregnating profiles and sheets with plastics or rubber and then drying them
    - Plants with capacities of 25-250 kg/h using organic solvents
  - 5.7 Plants with production capacities of 500 kg/week and up where styrene-added or or amine-base epoxy resin liquids and unsaturated polyester resins are processed
  - 5.10 Plants producing artificial sanding plates, parts, sandpaper or other sanding tissues using organic bonders or solvents
- 6. Wood and Cellulose
  - 6.2 Plants with one or more machines for producing cartons or corrugated cardboard, where the length of paper roll between the paper outlet and the cylinder is 75 m or more
- 7. Foodstuffs, Beverages, Feed and Agricultural Products
  - 7.1 Stables and chicken farms within municipal boundaries
    - a) 7000 hen capacity
    - b) 14,000 pullet and slaughtered chicken capacity
    - c) Plants with capacities of 700 cattle and 2000 sheep or goats or higher

**Table 1-1 (continued)**

**7.2 Slaughterhouses**

- a) Plants where 500-5000 kg of live chickens are slaughtered per week
- b) Plants where 4000-40,000 kg of other live animals are slaughtered per week

**7.4 Plants for the processing by heat of potatoes, vegetables, meat, fish and similar foodstuffs for human consumption, excluding the following:**

- Plants where the above foodstuffs are sterilized (canning factories)
- Restaurants, canteens, hospitals and similar institutions
- Butchers where less than 8000 kg of meat are processed per week
- Intestine and tripe cleaning plants, excluding plants with capacities under those given in 7.2, 7.4 and 7.5

**Meat and fish smoking plants, excluding the following:**

- Restaurants
- Plants with weekly capacities of less than 1000 kg

**7.6 Intestine and tripe cleaning plants, excluding plants with capacities less than those given in 7.2, 7.4 and 7.5**

**Plants where tanned animal hides are dried, salted and stored, excluding plants with capacities less than those given in 7.2, 7.4 and 7.5**

**7.12 Plants where untanned animal hides are dried, treated with salt and stored, excluding plants with capacities below the limits stated in 7.2, 7.4 and 7.5**

**7.13 Tanneries**

**7.17 Meal and feed grinding plants with daily capacity of 100-500 tons**

**7.18 Yeast and starch factories**

**7.19 Sugar factories**

**7.20 Molasses factories and breweries**

**7.21 Plants where spices are produced using animal and vegetable acids**

**7.22 Coffee roasting facilities with capacities of 75 kg/h**

**7.23 Plants for roasting coffee substitutes such as grains, cocoa and nuts**

**7.24 Powdered milk factories**

**7.25 Licorice and chocolate factories**

**8. Use and Disposal of Wastes**

**8.1 Plants with combustion capacities of 750 kg/h and up for partial or complete disposal of solid and liquid substances by incineration.**

**Table 1-1 (continued)**

**If plants for the disposal of halogenated hydrocarbons are to be operated for up to six months following startup in the same place, permission is required**

**8.3 Plants for the recovery of noble metals from ash-converting furnaces, including plants with less than 200 kg/day discharged materials**

**8.4 Garbage treatment plants with capacities of 1 ton/h and up**

**9. Storage, Filling, and Emptying of Materials**

**9.1 Storage plants with capacities of 3-30 tons and up for inflammable gases**

**9.2 Storage facilities with capacities of 10,000-50,000 tons for methanol recovered from mineral oils, liquid mineral oil products and other substances**

**9.3 Storage facilities with a capacity of 350-5000 tons for acryl nitrile**

**9.4 Storage facilities with a capacity of 10-200 tons for chlorine**

**9.5 Storage facilities with a capacity of 20-500 tons for sulfur dioxide**

**9.6 Storage facilities with a capacity of 200-2000 tons for liquid oxygen**

**9.7 Storage facilities with a capacity of 500-5000 tons for ammonium nitrate**

**9.8 Storage facilities with a capacity of 25-250 tons for sodium chlorate**

**9.9 Pesticide and insecticide storage facilities with capacities of 5 tons and up**

**9.11 Open or not completely enclosed storage plants where accumulations of dry, dusty substances are loaded and unloaded by means of dumpers, dump trucks, power shovels and other technical machinery, including plants where 200 tons/day and up of materials are transferred, and excluding excavations and mineral ore production plants**

**10. Others**

**10.6 Plants used for the purification and preparation of sulfate turpentine oil or tar oil**

**10.7 Vulcanization plants for natural or synthetic rubber using sulfur or sulfur compounds, excluding the following:**

- Plants processing less than 50 kg of rubber per hour**
- Plants using only vulcanized rubber**

**10.9 Plants where wood preservatives are produced using halogenated aromatic hydrocarbons, excluding those mentioned in 4.1**

**10.10 Plants where flock, thread or fabric is dyed using dye accelerators**

**10.11 Thread or cloth bleaching plants where alkalis, chlorine and chlorine compounds are used**

**Table 1-1 (continued)**

- 10.12 Automatic glass bottle washing, filling or packaging plants with an hourly capacity of 25,000 bottles and up
- 10.13 Automatic car washes
- 10.14 Pit saws with a driving power of 100 kW and up
- 10.15 Testing centers for motors and gas turbines with a rated power of 3000 kW and up, or testing platforms where such motors and turbines are found
- 10.16 Testing centers for helicopters, jets or other retro-propelled vehicles, or places where such vehicles are found
- 10.17 Motor sport training facilities used for five or more days a year
- 10.18 Air liquefaction plants with capacities of 25 tons/h and up





**Table 1-2**

**Standards for Air Quality**  
(Air Quality Protection Regulation, Section 2, Article 6)

**a)General**

	Unit	Long term standard	Short term standard
1. Sulfur dioxide (SO <sub>2</sub> ) including sulfur trioxide (SO <sub>3</sub> )			
a)General	µg/m <sup>3</sup>	150	400
b)Industrial zones	µg/m <sup>3</sup>	250	400
2. Carbon monoxide (CO)	µg/m <sup>3</sup>	10,000	30,000
3. Nitrogen dioxide (NO <sub>2</sub> )	µg/m <sup>3</sup>	100	300
4. Nitrogen monoxide (NO)	µg/m <sup>3</sup>	200	600
5. Chlorine (Cl <sub>2</sub> )	µg/m <sup>3</sup>	100	300
6. Hydrogen chloride (HCl) and gaseous inorganic chlorine (Cl <sup>-</sup> )	µg/m <sup>3</sup>	100	300
7. Hydrogen fluoride (HF) and gaseous inorganic fluorine (F <sup>-</sup> )	µg/m <sup>3</sup>	-	10
8. Ozone (O <sub>3</sub> ) photochemical oxidizers	µg/m <sup>3</sup>	-	240
9. Hydrocarbons (HC)	µg/m <sup>3</sup>	-	1409
10. Hydrogen sulfide (H <sub>2</sub> S)	µg/m <sup>3</sup>	-	40
11. Suspended particulate matter (PM) (particles of 10 microns and smaller)			
a)General	µg/m <sup>3</sup>	150	300
b)Industrial zones	µg/m <sup>3</sup>	200	400
12. Lead (Pb) in PM and its compounds	µg/m <sup>3</sup>	2	-
13. Cadmium (Cd) and its compounds	µg/m <sup>3</sup>	0.04	-

**Table 1-2 (continued)**

	Unit	Long term standard	Short term standard
14. Settling dust (includes particles larger than 10 microns)			
a)General	mg/m <sup>2</sup> /day	350	650
b)Industrial zones	mg/m <sup>2</sup> /day	450	800
15. Lead (Pb) and its compounds in settling dust	µg/m <sup>2</sup> /day	500	-
16. Cadmium (Cd) and its compounds in settling dust	µg/m <sup>2</sup> /day	7.5	-
17. Thallium (Tl) and its compounds in settling dust	µg/m <sup>2</sup> /day	10	-

**Table 1-3**

**Standards for air pollutants in special conservation areas**  
(Air Quality Protection Regulation, Article 6, Section 3).

	Unit	Long-term standard
Sulfur dioxide	$\mu\text{g}/\text{m}^3$	60
Gaseous inorganic chlorine compounds	$\mu\text{g}/\text{m}^3$	60
Gaseous inorganic fluorine compounds	$\mu\text{g}/\text{m}^3$	0.3
Lead	$\mu\text{g}/\text{m}^2/\text{day}$	250
Cadmium	$\mu\text{g}/\text{m}^2/\text{day}$	2.5



**Table 1-4**

**Classification of Organic Vapors and Gases**

(Air Quality Protection Regulation, Annex 4)

(NOTE: Organic substances not found in this list shall be included in the class of substances with effects most like theirs in vapor and gaseous states. If it is impossible to group them according to their effects, they should be included in the group with the most similar chemical structure.)

Substance	Chemical formula	Class
Acetaldehyde	$\text{CH}_3\text{CHO}$	II
Acetic acid	$\text{CH}_3\text{COOH}$	II
Acetic acid n-butyl ester	$\text{CH}_3\text{COOC}_4\text{H}_9$	III
Acetic acid ethyl ester	$\text{CH}_3\text{COOC}_2\text{H}_5$	III
Acetic acid n-methyl ester	$\text{CH}_3\text{COOC}_5\text{H}_{11}$	II
Acetic acid methyl ester	$\text{CH}_3\text{COOCH}_3$	II
Acetic acid vinyl ester	$\text{CH}_3\text{COOCHCH}_2$	II
Acetone	$\text{CH}_3\text{COCH}_3$	III
Acrylaldehyde	$\text{CH}_2\text{CHHO}$	I
Acrylic acid	$\text{CH}_2\text{CHCOOH}$	I
Acrylic acid ethyl ester	$\text{CH}_2\text{CHCO}_2\text{C}_2\text{H}_5$	I
Acrylic acid methyl ester	$\text{CH}_2\text{CHCOCH}_3$	I
Amylacetate	$\text{CH}_3\text{COOC}_5\text{H}_{11}$	II
Aniline	$\text{C}_6\text{H}_5\text{NH}_2$	I
Benzene (containing over 25% C7 and C8 aromatics by mass)		II
Butadiene (1,3)	$\text{CH}_2\text{CHCHCH}_2$	II
n-Butyl acetate	$\text{CH}_3\text{COOC}_4\text{H}_9$	III
n-Butyl alcohol	$\text{C}_4\text{H}_9\text{OH}$	III
Butyric acid (Butanoic acid, Butter acid)	$\text{C}_3\text{H}_7\text{COOH}$	I
Carbon sulfide	$\text{CS}_2$	II
Carbon tetrachloride	$\text{CCl}_4$	I
2-Chlorbutadiene 1,3	$\text{CH}_2\text{CClCHCH}_2$	II
Chloroform (Trichloromethane)	$\text{CHCl}_3$	II
Chloropropionic acid	$\text{CH}_3\text{CHClCOOH}$	I
Cresol (Hidroxitoluene)	$\text{C}_6\text{H}_4(\text{CH}_3)\text{OH}$	I
Cyclohexane	$\text{C}_6\text{H}_{12}$	III
Cyclohexanol	$\text{C}_6\text{H}_{11}\text{OH}$	III
Cyclohexanone	$\text{C}_6\text{H}_{10}$	II
Diacetone alcohol	$(\text{CH}_3)_2\text{C}(\text{OH})\text{CH}_2\text{COCH}_3$	II
1,1-Dibromoethane	$\text{CH}_3\text{BrCH}_2\text{Br}$	II
p-Dichlorobenzene and o-Dichlorobenzene	$\text{C}_6\text{H}_4\text{Cl}_2$	II

Table 1-4 (continued)

Substance	Chemical formula	Class
1,1-Dichloroethane (ethylene chloride)	$\text{CHCl}_2\text{CH}_3$	II
1,2-Dichloroethane	$\text{ClCH}_2\text{CH}_2\text{Cl}$	I
1,2-Dichloroethylene	$\text{CHClCHCl}$	III
Dichloromethane	$\text{CH}_2\text{Cl}_2$	III
Dichlorophenol	$\text{C}_6\text{H}_3\text{Cl}_2\text{OH}$	I
Diethanol amine	$(\text{OHCH}_2\text{CH}_2)_2\text{NH}$	II
Diethylamine	$(\text{C}_2\text{H}_5)_2\text{NH}$	I
Diethyl ether	$(\text{C}_2\text{H}_5)_2\text{O}$	III
Diisopropylether	$(\text{CH}_3)_2\text{CHOCH}(\text{CH}_3)_2$	III
Dimethylamine	$(\text{CH}_3)_2\text{NH}$	I
Dimethylaniline	$\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$	I
Dimethylethylamine	$(\text{CH}_3)_2\text{C}_2\text{H}_5\text{NH}_2$	I
Dimethylformamide	$\text{HCON}(\text{CH}_3)_2$	II
Dimethylsulfide	$\text{CH}_3\text{SCH}_3$	I
Dimethylsulfoxide	$(\text{CH}_3)_2\text{SO}$	III
Dinitrobenzene	$\text{C}_6\text{H}_4(\text{NO}_2)_2$	I
1,4-Dioxane	$\text{C}_4\text{H}_8\text{O}_2$	II
Diphenyl	$(\text{C}_6\text{H}_5)_2$	I
Ethanol (ethyl alcohol)	$\text{C}_2\text{H}_5\text{OH}$	III
Ethylchloride	$\text{CH}_3\text{CH}_2\text{Cl}$	III
Ethylene glycol	$\text{HOCH}_2\text{CH}_2\text{OH}$	III
Ethylene glycol monomethyl ether	$\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$	II
Ethylene oxide	$\text{CH}_2\text{OCH}_2$	I
Ethylenediamine	$\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$	II
2-Ethylhexanol-1	$\text{CH}_3(\text{CH}_2)_3\text{CH}(\text{C}_2\text{H}_5)\text{CH}_2\text{OH}$	II
Formaldehyde	$\text{HCHO}$	I
Formic acid	$\text{HCOOH}$	I
Furfural	$\text{C}_5\text{H}_4\text{O}_2$	I
n-Heptane	$\text{C}_7\text{H}_{18}$	III
Hexamethylene diisocyanate	$\text{OCH}(\text{CH}_2)_6\text{NCO}$	I
n-Hexane	$\text{C}_6\text{H}_{14}$	III
Hexanoic acid (Caproic acid)	$\text{CH}_3(\text{CH}_2)_4\text{COOH}$	I
4-Hydroxy 4-methyl pentanone-2	$(\text{CH}_3)_2\text{C}(\text{OH})\text{CH}_2\text{COCH}_3$	III
Isobutyl alcohol	$(\text{CH}_3)_2\text{CHCH}_2\text{OH}$	III
Isopropylether	$(\text{CH}_3)_2\text{CHOCH}(\text{CH}_3)_2$	III
Ketene (Carbomethane)	$\text{CH}_2\text{CO}$	I
Lead tetraethyl	$\text{Pb}(\text{C}_2\text{H}_5)_4$	I
Mercaptans		I
Metacrylic acid methyl ester	$\text{CH}_2\text{C}(\text{CH}_3)\text{COOCH}_3$	II
Methanol (Methyl alcohol)	$\text{CH}_3\text{OH}$	III
Methylamine	$\text{CH}_3\text{NH}_2$	I
Methylbutylketone	$\text{CH}_3\text{CO}(\text{CH}_2)_3\text{CH}_3$	
Methylcyclohexane	$\text{C}_6\text{H}_{11}\text{CH}_3$	III

Table 1-4 (continued)

Substance	Chemical formula	Class
Methylcyclohexanone	$\text{CH}_3\text{C}_5\text{H}_9\text{CO}$	II
Methylethylketone	$\text{CH}_3\text{COC}_2\text{H}_5$	III
Methylisobutylketone	$(\text{CH}_3)_2\text{CHCH}_2\text{COCH}_3$	III
Methylisocyanate	$\text{CH}_3\text{NCO}$	I
Methylnaphthalene	$\text{C}_{10}\text{H}_7\text{CH}_3$	II
Monochloroacetic acid	$\text{CH}_2\text{ClCOOH}$	I
Monochlorobenzene	$\text{C}_6\text{H}_5\text{Cl}$	II
Monoethanolamine	$\text{H}_2\text{NCH}_2\text{CH}_2\text{OH}$	II
Monoethylamine	$\text{C}_2\text{H}_5\text{NH}_2$	I
Morpholine (Diethylene imidioxide)	$\text{O}(\text{CH}_2)_4\text{NH}$	II
Naphthalene	$\text{C}_{10}\text{H}_8$	II
Nitrobenzene	$\text{C}_6\text{H}_5\text{NO}_2$	I
Nitrocresol (2-Nitro p-hydroxytoluene)	$\text{CH}_3\text{C}_6\text{H}_3\text{OHNO}_2$	I
Nitrophenol	$\text{NO}_2\text{C}_6\text{H}_4\text{OH}$	I
Nitrotoluene	$\text{NO}_2\text{C}_6\text{H}_4\text{CH}_3$	II
n-Pentane	$\text{C}_5\text{H}_{12}$	III
Pentanol-1	$\text{C}_5\text{H}_{11}\text{OH}$	III
Phenol	$\text{C}_6\text{H}_5\text{O}$	I
Phosgene	$\text{COCl}_2$	I
Polychloric diphenols		I
1-Propanol-isopropyl alcohol	$(\text{CH}_3)_2\text{CHOH}$	III
Propionic acid	$\text{C}_3\text{H}_7\text{COOH}$	II
Propylene oxide	$\text{CH}_3\text{CHCH}_2\text{O}$	II
Pyridine	$\text{C}_5\text{H}_5\text{N}$	I
Styrene (Phenylethylene, Vinyl benzene)	$\text{C}_6\text{H}_5\text{CHCH}_2$	II
Tetrachlorethane	$\text{C}_2\text{H}_2\text{Cl}_4$	I
Tetrachlorethylene	$\text{Cl}_2\text{C}=\text{CCl}_2$	III
Tetrahydrofuran	$\text{C}_4\text{H}_8\text{O}$	II
Tetrahydronaphthalene	$\text{C}_{10}\text{H}_{12}$	II
Thioether	$\text{C}_4\text{H}_8\text{S}$	I
Toluene	$\text{C}_6\text{H}_5\text{SH}$	I
Toluene diisocyanate	$\text{CH}_3\text{C}_6\text{H}_4(\text{NCO})_2$	I
Triethanolamine	$(\text{CH}_2\text{OHCH}_2)_3\text{N}$	II
Triethylamine	$(\text{C}_2\text{H}_5)_3\text{N}$	I
Triethylene glycol	$\text{HO}(\text{C}_2\text{H}_4\text{OC}_2\text{H}_4\text{OC}_2\text{H}_4\text{OH})$	III
Trimethylamine	$(\text{CH}_3)_3\text{N}$	I
1,1,1-Trichloroethane	$\text{CH}_3\text{CCl}_3$	III
1,1,2-Trichloroethane	$\text{CH}_2\text{ClCHCl}_2$	I
Trichloroethylene	$\text{CCl}_2\text{CHCl}$	II
Trichlorophenol	$\text{C}_6\text{H}_2\text{Cl}_3\text{OH}$	I
Trioxane metaformaldehyde	$(\text{CH}_2\text{O})_3$	
Valeric acid (Pentanoic acid)	$\text{CH}_3(\text{CH}_2)_4\text{COOH}$	
Vinyl benzene	$\text{C}_6\text{H}_5\text{CHCH}_2$	II
Xylene	$\text{C}_6\text{H}_4(\text{CH}_3)_2$	II





**Table 1-5**

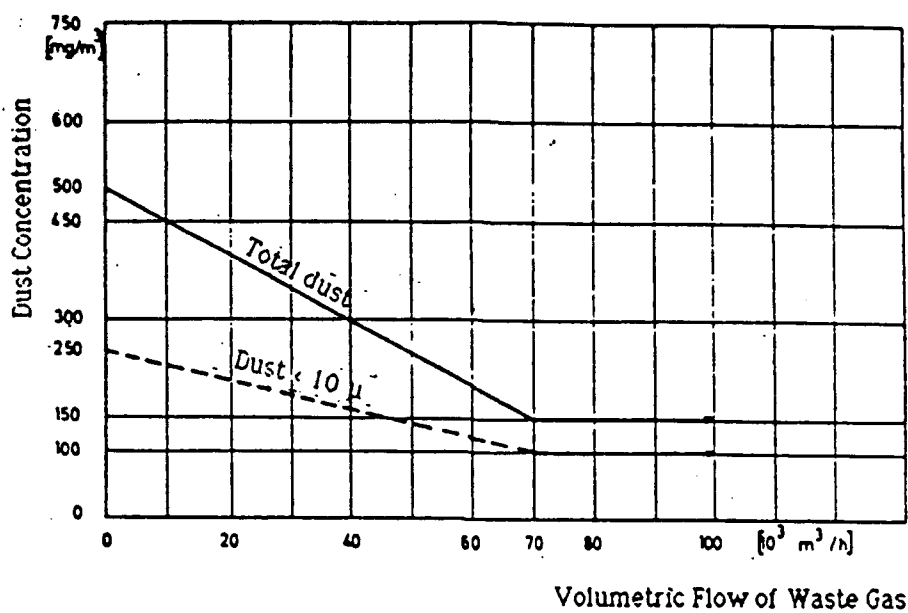
**Classification of Carcinogenic Compounds**  
(Air Quality Protection Regulation, Annex 5)

Arsenic trioxide and arsenic pentoxide	
Arsenic acids, arsenic and its salts (given as As)	II
Asbestos (cresotil, cresodolite, amosite, antophyllite, axionolite and tremolite in the form of fine dust)	I
Benzopyrene	I
Beryllium and its compounds (given as Be)	I
Dibenzoanthracene	I
1,2-Dibromomethane	III
3,3-Dichlorobenzidine	II
Dimethylsulfate	II
Ethylene amine	II
Hydrazine	III
1-chloro-2,3-epoxypropane (epichlorohydrin)	I
Chromium IV compounds (calcium chromate, chromium III chromate, strontium chromate and zinc chromate, given as Cr)	II
Cobalt (cobalt metal in the form of respirable dusts and aerosols and difficult to dissolve cobalt salts; given as Co)	II
2-Naphtylamine	I
Nickel (respirable dusts and aerosols of nickel metal, nickel sulfide and sulfide minerals, nickel oxide and nickel carbonate, nickel tetracarbonyl, given as Ni)	II



**Table 1-6**

**Dust Emission Standards**  
(Air Quality Protection Regulation, Section 2, Article 7)





**Table 1-7**

**Classification of Special Substances in Dust Emissions**

(Air Quality Protection Regulation, Annex 3)

Aluminum Carbide	III
Aluminum nitride	III
Ammonia compounds	III
Antimony and its soluble compounds	II
Copper and its soluble compounds	III
Copper fumes	I
Barium sulfate	III
Barium compounds (soluble)*	II
Bitumens	III
Bismuth	III
Boronic trifluoride	II
Boron compounds (soluble)	III
Mercury and its compounds (excluding mercury sulfide minerals)	I
Soluble fluorine compounds	I
Zinc and its compounds	II
Ferrosilicum	III
Fluoride minerals	II
Phosphorus pentoxide	I
Phosphates	III
Silver compounds (readily soluble like silver nitrate)	II
Iodine and its compounds	II
Cadmium and its soluble compounds (excluding cadmium chloride in aerodols and respirable dusts)	I
Calcium cyanamide	III
Calcium fluoride	II
Calcium hydroxide	III
Calcium oxide	III
Chromium VI compounds (non-carcinogens)	I
Cobalt compounds (non-carcinogens)II	
Crystobalite (particles smaller than 5 microns)	II
Kieselguhr	II
Quartz (particles smaller than 5 microns)	II
Tar (excluding lignite tar)	II
Thick tar (excluding lignite tar)	II

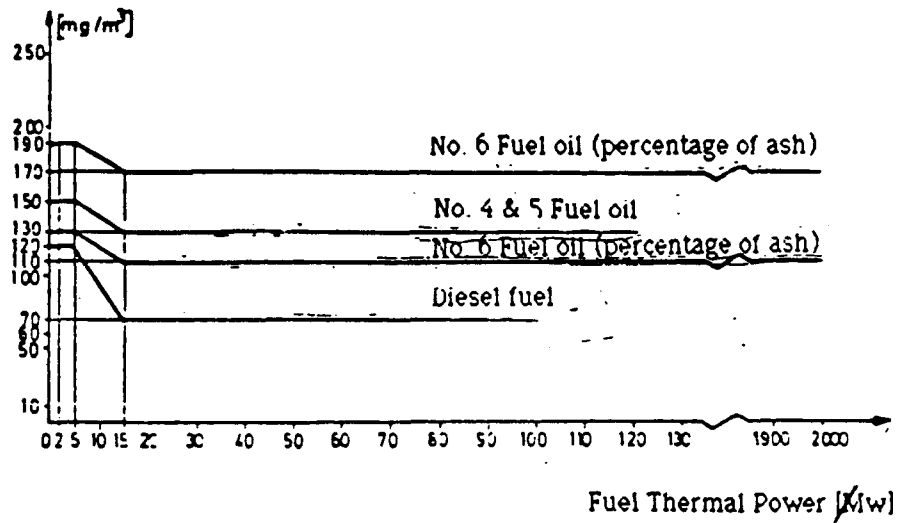
**Table 1-7 (continued)**

Quartz mineral tridimite (particles smaller than 5 microns)	II
Soot	II
Lead and its soluble compounds	I
Magnesium hydroxide	III
Molybdenum and its soluble compounds	III
Nickel compounds (excluding carcinogens)	I
Selenium and its soluble compounds	I
Silicium carbide	III
Strontium and its compounds	II
Tellurium and its soluble compounds	I
Thallium and its compounds	I
Uranium and its compounds	I
Vanadium and its compounds	I
Tungsten and its compounds (excluding tungsten carbide)	III
Organic compounds in dust, i.e. anthracene, amines, 1-4-benzokenone, naphthalene	II

\* Soluble compounds that dissolve to some extent in the respiratory and digestive tracts, or on the skin or on plant surfaces with resulting harmful effects.

**Table 1-8**

**Dust Emission in Flue Gases of Plants With Thermal Power of No More Than 2 Mw.**  
(Air Quality Protection Regulation, Annex 7, Section 1.2.1)







**Table 1-9**

**Threshold Levels Of Substances Requiring Air Quality Testing**

(Air Quality Protection Regulation, Annex 2)

<b>Harmful Substance Emitted</b>	<b>Mass Flows During Hours Of Operation On Weekdays Under Normal Operating Conditions</b>
Dust	15 kg/h
Lead	0.5 kg/h
Cadmium	0.01 kg/h
Thallium	0.01 kg/h
Chlorine	20 kg/h
Hydrogen chloride and gaseous inorganic chlorine compounds	20 kg/h
Hydrogen fluoride and gaseous inorganic fluorine compounds	20 kg/h
Carbon monoxide	1000 kg/h
Sulfur dioxide	60 kg/h
Nitrogen dioxide	40 kg/h

(NOTE: The emissions in the table are the hourly mass flows from the entire plant.)



<b>INSTALLATION</b>	<b>COMPLIANCE CATEGORY:</b> <b>AIR EMISSIONS MANAGEMENT</b> <b>Turkey</b>	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> <b>NA   C   RMA</b>	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Base Civil Engineering/Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LGS (Base Supply) (7) MWR (Morale, Welfare, and Recreation) Auto Hobby Shop (8) Refrigeration Shops (BCE) (9) Equipment Maintenance Squadron (10) AAFES (Army/Air Force Exchange Service) Gas Station

## **Section 2**

### **Hazardous Materials Management**

## Section 2

### HAZARDOUS MATERIALS MANAGEMENT

#### A. Applicability

Since it can be expected that hazardous materials are used as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *Water Pollution Control Regulation.* This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution. This includes guidance on the storage and use of dangerous and hazardous substances.

#### C. State Laws and Regulations

- None available at this time

#### D. Key Compliance Definitions

- *Dangerous and Hazardous Substances* - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic effects or which are resistant to biological treatment processes, and which, in order not to cause pollution of ground and surface waters, require special treatment or elimination in accordance with the Communiqués to be based on this regulation (Water Pollution Control Regulation, Article 2).
- *Dangerous and Harmful Substances in Water* - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic or teratogenic effects or which are resistant to biological treatment processes, and which cause pollution of ground and surface waters without special treatment or elimination, and which cause danger to the environment (Communiqué on Dangerous and Hazardous Materials in Water, Article 2).



## **HAZARDOUS MATERIALS MANAGEMENT**

### **GUIDANCE FOR CHECKLIST USERS**

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	<b>REFER TO WORKSHEET ITEMS:</b>	<b>CONTACT THESE PERSONS OR GROUPS: (*)</b>
<b>All installations</b>	<b>2-1 through 2-9</b>	<b>(1)(2)(3)(4)(5)(6)(7)</b>

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#### **(\*) CONTACT/LOCATION CODE:**

- (1) LGS (Base Supply)
- (2) BCE (Base Civil Engineering)
- (3) Fire Department
- (4) Safety Officer
- (5) BEE (Bioenvironmental Engineering)
- (6) Disaster Preparedness Office
- (7) LGT (Transportation Officer)





## **HAZARDOUS MATERIALS MANAGEMENT**

### **Records to Review**

- Spill Control and Contingency Plan
- Emergency Plan documents
- Material Safety Data Sheets
- Inventory records
- Training records
- Inspection records
- Shipping papers
- Placarding of hazardous materials

### **Physical Features to Inspect**

- Hazardous materials storage areas
- Shop activities
- Shipping and receiving area

### **Sources to Interview**

- BCE (Base Civil Engineering)
- LGS (Base Supply)
- Fire Department
- BEE (Bioenvironmental Engineering)
- Safety Manager
- LGT (Transportation Officer)
- Disaster Preparedness Office



**COMPLIANCE CATEGORY:  
HAZARDOUS MATERIALS MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ALL INSTALLATIONS</b></p> <p><b>2-1.</b> Determine actions or changes since previous review of hazardous materials management (GMP). ...</p> <p><b>2-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP). ...</p> <p><b>2-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding). ...</p> <p><b>2-4.</b> Organizations domiciled in Turkey, which are required to obtain special permission or license to produce, store, transport or sell certain combustible materials, are required to carry insurance against damages caused by these materials (Decree No. 21002, Article 1). ...</p> <p><b>2-5.</b> The documentation of the insurance policy must be made available (Decree No. 21002, Articles 7 and 9).</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2) ...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1) - <i>Water Pollution Control Regulation</i> ...</p> <p>Determine if any new regulations concerning hazardous materials management have been issued since the finalization of the manual. (1) Verify that the installation is in compliance with newly issued regulations. (1) ...</p> <p>Determine whether the installation produces, stores, transports or sells any of the following substances: (1) - petroleum and petroleum products - ammunition and explosives - chemical fertilizers, chemical salts, bases and colorants - other chemical materials (oxygen, acetylene, carbide-synthetic gasoline, azod, peroxide, etc.) - pyrotechnical materials (illuminating and signal shells, firecrackers, fireworks, caps for toy pistols), excluding those sold retail - spirits, alcohol - matches - liquefied petroleum gas - coal gas. Verify that the installation carries liability insurance for damages caused by such materials. ...</p> <p>Verify that the documentation of such insurance is displayed on the installation where it can be seen by inspectors. (1) Verify that the installation sends a copy of the insurance policy to the agency issuing the license.</p>

(1) LGS (Base Supply) (2) BCE (Base Civil Engineering) (3) Fire Department (4) Safety Officer (5) BEE (Bioenvironmental Engineering) (6) Disaster Preparedness Office (7) LGT (Transportation Officer)

**COMPLIANCE CATEGORY:  
HAZARDOUS MATERIALS MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
<p><b>2-6.</b> Activities that make use of certain hazardous substances are prohibited (Water Pollution Control Regulation, Article 22, Section C).</p> <p style="text-align: center;">...</p>	<p>Verify that no activities making use of the substances mentioned in the "Communique on Dangerous and Hazardous Substances" are done on the installation. (1)(2)(4)(5)(6)(7)</p> <p>(NOTE: Table 2-1 through 2-4 contain lists as divided according to classifications of the substance. An explanation of letter codes used in Table 2-1 through 2-4 can be found before Table 2-1.)</p> <p style="text-align: center;">...</p>
<p><b>2-7.</b> Hazardous materials that may become dissolved in wastewater or rainwater and then conveyed to groundwater must not be directly stored on the ground within a groundwater feeding basin (Water Pollution Control Regulation, Section 4, Article 22, para G)</p> <p style="text-align: center;">...</p>	<p>Verify that hazardous materials that may be come dissolved in wastewater or rainwater are not directly stored on the ground within a groundwater feeding basin. (1)(2)(4)(5)(6)(7)</p> <p style="text-align: center;">...</p>
<p><b>2-8.</b> All storage tanks for chemical substances of all kinds must be constructed in such a way to prevent seepage from contaminating the groundwater (Water Pollution Control Regulation, Section 4, Article 22, para I).</p> <p style="text-align: center;">...</p>	<p>Verify that tanks are constructed to prevent seepage. (1)(2)(4)(5)(6)(7)</p> <p style="text-align: center;">...</p>
<p><b>2-9.</b> In order to prevent pollution of groundwater during an accident involving the use of dangerous and hazardous substances, spill cleanup materials are required to be available (Water Pollution Control Regulation, Section 4, Article 22, para N).</p> <p style="text-align: center;">...</p>	<p>Verify that spill cleanup materials are available at storage and use sites. (1)(2)(3)(4)(6)</p> <p style="text-align: center;">...</p>

(1) LGS (Base Supply) (2) BCE (Base Civil Engineering) (3) Fire Department (4) Safety Officer (5) BEE (Bioenvironmental Engineering) (6) Disaster Preparedness Office (7) LGT (Transportation Officer)

## Letter Codes Used in Tables 2-1 through 2-4

### General Explanations:

A: Carcinogenic substances

B: Likely carcinogenic substances

C: In the conditions of being barely dissolved in water making it impossible to calculate its danger limit in water by other reasons, substances are classified by conjecturing the degree to which dangers affect water.

D: Substances with the strong possibility of accumulating

E: Substances that are found close to the limit level are taken place in a higher WDC class.

### Explanation of symbols used in solubility of substances in water.

s : soluble

hs: hardly soluble

ls : less soluble

&: soluble in any portion

a : approximately



**Table 2-1**

**Very Dangerous and Harmful Substances for Water Receptor Mediums  
(WDC 4)**

Index #	Sub- stance Name	Water Solu- bility	Acute Oral Toxicity Mammals	Acute Toxicity # Bacteria	Acute Toxicity # Fish	Danger # H <sub>2</sub> O	Exptltns.
10	Acrylnotril	s	5		4.6		A,C
7	Acetone Cyanhydr		7		5.8		C
29	Benzine	1	1800	4.0	4.5	3.2	A
180	Merc(2)chloride	s	5	8	6.3	6.4	
70	p-p'- DDT	0.0012	5				C,D
23	Disodhyrgarsnt	s	5	4.7	4.0	3.9	A
92	Epi Chlorhidrin	hs	5	4.3	4.6	4.6	A
167	Ethyl Paration	24	7		6.3		C,F
108	Ethyl Imino	&	7	5.3	5.7	6.0	A
185	Silver Nitrate	2.1mln	5	8.2	6.4	6.5	
130	Hydrg. hydroxst		7	7.7	6.1	6.9	A
49	Cadm. Nitrate	s	3	7.1	4.2	4.8	
35	Lead Tetra Eth	300					
143	Linden	10	5		6.6		C
144	Merkaptan						F
60	Sodmcynate	s	7	9	7.2	7.7	





Table 2-2

**Dangerous and Harmful Substances for Water Receptor Mediums  
(WDC3)**

Index #	Substance Name	Water Solu- bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac- terias	Acute Toxcty Fish	Danger # Water	Expintns.
9	Acryolin	265000	5	6.7	5.6	5.8	
14	Allilamin	&	5	3.2	4.2	4.1	
20	Anilin	34000	3	3.9	4.2	3.7	F
21	Anisol	hs	5		3.9		C
1	Acetalydhyde	&	3		3.9		C,F
5	Acetateacid methylesther	350000					F
8	Acetonitril	&	1	3.2	2.2	2.1	
24	Atrazene	70	1		4.5		C
141	Copperdisulfate	s	3	7.5	6.1	5.5	
33	Benzelchloride	hs	3	5.3	5.5	4.6	
31	Benzonitril	hs	5	5.0	4.0	4.7	
34	Beryliumnitrate	s	1	7.7	4	4.2	A
76	1,2 diethylbenz	200	3		4.5		C
74	2,4 dichlorbenz	150	3	4.8	4.5	4.1	
75	2,3 dichlorphenl	4,500	3	5.2	5.3	4.5	C
82	2,4 dimethylanln	hs	3	5.1	3.7	3.9	E
73	Di-n-butilate	s			4.2		C
84	1,3 dinitrobenz	650	5	4.9	5	5	
85	Dinirbutolphenol	50	5		5.7		C,F
103	Ethyl diamine	&	3	6.1	3.4	4.2	
109	2-ethyl hexsilam	s	3	4.1	4.8	4.0	
102	ethyline chlorid	8650	3	3.9	3.5	3.5	
171	Phenylacetate	1000	3	3.9	4.9	3.9	E
170	Phenol	82000	3	4.2	4.6	3.9	E
173	Phtalicaciddiaslt	hs	3	4	6.4	4.5	
112	Formaldehyde 35% by volume soluble	s	3	4.9	4.0	4.0	
119	Fuel Oil(163/345)	5	1				C
113	Furfurol	83000	5	4.8	4.5	4.8	
115	Gasoil(172/323)	5	1				C
117	Glycacid butol est	46000					F
123	Hexachlorbutane	hs	3				E
128	Hydroquinone	72000	3	4.2	6.8	4.7	
134	Isooctanol	s		4.2	4.6		C
50	Karbaril	<1000	3		4.7		C,F
189	Carb tetra chloride	770	1	4.5	4.0	3.2	
139	Kerosene (158/246)	10	1				C

Table 2-2 (continued)

Index #	Substance Name	Water Solu-bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac-terias	Acute Toxcty Fish	Danger # Water	Expltnts.
51	Chlorhydrate	&	3	5.8	2.8	3.9	E
53	Chlorbenzene	490	1	4.8	7.7	4.2	
157	Chlor phen metox methyolate	580	1	5	4.1	3.4	
54	Choloroform	8200	1	3.9	3.8	2.9	B
55	2-Chlortoluene	hs	1	4.8	4.1	3.3	
140	m-Cresole	31000	3	4.3	4.7	4.0	
206	Xylene	200	3		4.1		C,F
59	Kumol Hydrperox	hs	3		4.9		C
35	Lead 2-acetate	s	1	5.7	3.2	3.3	D,F
183	Carbon Sulfate(CS <sub>2</sub> )	2200	3		4.0		C
76	Diesel(161/334)	5	1				C
147	Methyl acrylate	60000	5	4.3	5.1	4.8	
145	Methy acetate	292000					F
149	Metylene chloride	20000	1	3.3	3.3	2.5	
155	Mineral turpentine	20	1				C
156	Monoflor acetic acid		7	4.2	3.6	4.9	
159	Nickel chlorate	550000	5	8.5	3.2	5.6	B
132	Nitrilisobutirate	ls	5		3.6		C
162	4-Nitroaniline	600	3	5.4	4.5	4.3	
163	Nitrobenzene	1900	3	5.2	4.2	4.1	
164	2-Nitrotoluene	a 40	3	4.7	4.5	4.1	
27	Petrolether(40/71)	50	1				C
28	petrolether(61/135)	40	1				C
175	Picratacid (50% soluble)	&	5	3.0	3.5	3.8	E
179	Pridine	&	3	3.5	3.6	3.4	F
177	2-Propinol-1	1	5	3.8	5.7	4.8	
181	Salycilaldehyde	1700	3	5.0	5.4	4.5	
67	Cyclohexilamine	s	5	3.4	3.7	4.0	
56	Sodiumdichromate	s	3	6.1	3.7	4.3	A
161	Sodiumnitrate	s	7	3.9	3.5	4.8	
184	Sodiumselenite	a s	7	4.7	4.0	5.2	
188	Sodiumsulfur	180000	7	5.8	4.6	5.8	
186	Naphta solvent	(186/210)	15	1			C
187	Styrene	320	1	4.1	4.8	3.3	F
192	Thallium 1-nitrate	96000	5		3.7		C
194	Toluene	470	1	4.5	4.2	3.2	F
195	O-Toludine	15000	3	4.8	3.9	3.9	B,E
198	1,1,1-Trichlorethane	1300	1	4.0	3.9	3.0	
199	Trichlorethylene	1000	1	4.2	3.9	3.0	B
203	Vinyl acetate	20000	1	5.2	4.6	3.6	F
204	VKNormal	160	1		4.4		C
205	VKSuper	380	1		5.7		C

**Table 2-3**

**Less Dangerous and Harmful Substances for Water Receptor Mediums  
(WDC2)**

Index #	Substance Name	Solu- bility	Acute Oral Toxcty	Acute Toxcty	Acute Toxcty	Danger Level	Explatn.
		Water	Mammal	Bacteria	Fish	Water	
11	Acrylic acid	&	1	4.5	3.5	3.0	
12	Acrylacdbutester	1400	1	4.1	4.6	3.2	
13	Acrylic acid 2-ethyl hexyl- ester	hs	1		4.6		C
15	Allilchlorate	1000	3	3.9	4.2	3.7	B
16	n-Allil thio urea	s		3.9	2.4		C
18	Amyl alcohol	27000	3	3.7	3.3	3.3	
17	Amyl acetate	hs	1	3.8	3.9	2.9	
193	Ammonium thio sulphate						F
2	Acetamide	2200	1	2.0	2.0	1.7	B
3	Acetanhydrate	136000	3	2.9	3.6	3.2	
93	Aceticacid	&	1	2.6	3.4	2.3	
133	Aceticacid isobutylester	53000	1	3.7	3.9	2.9	
178	Aceticacid propyl ester	18900	1	3.8	3.7	2.8	
25	Barium chloride	360000	3		3.1		C
26	Benzaldehyde	3000	1	3.3	3.3	3.2	
30	Benzoic acid	3700	3	3.3	3.3	3.2	
32	Benzotrighloride (trichlormethyl benzene)	hs	1		2.4	1.1	C
39	n-Butanol	90000	1	3.2	2.9	2.4	
41	n-Butanic acid	&	1	3.1	3.3	2.5	
48	n-Butol aldehyde	37000	1	4.0	3.9	3.0	
44	n-Butilamine	&	3	3.1	3.6	3.2	
42	n-Butilacetate	10000	1	3.9	3.9	2.9	
100	Buteric acid ethyl ester	6200	1	3.8	4.1	3	
46	Butil di-glycol	&		3.6	2.7		C
207	Zinc chloride	370000	3		4.7		C
71	n-decanol	hs	1		6.2		C
72	Di-acetonealco- hol	&	1	3.1	2.1	2.1	
90	Dodiesel benzene	hs	1		3.1		C

Table 2-3 (continued)

Index #	Substance Name	Solu- bility	Acute Oral Toxcty	Acute Toxcty	Acute Toxcty	Danger Level	Expintn.
		Water	Mammal	Bacteria	Fish	Water	
91	Dodiesel hydrogen sulphate sodiumsalt	s	3	3.5	4.7	3.7	
77	Di-ethanolamin	s	3	2	2.7	2.6	
79	Di-ethylene glycol	s	1	2.1	2	1.5	
80	Di-ethyl ester	75000	1		2.6		C
81	Di-ethyl oxilate	s		2	3.5		C
88	Diphenolesther		1		5.5		C
89	Diphenylmethane	hs	1		5.1		C
83	Dimethyl formamid	&					F
86	Dioxin	&	1	2.6	2.1	1.9	B.E
87	Dipentene	hs	1		4.5		C
94	Ethanol amin	&	1	2.2	3.3	2.2	
97	Ethanol amin (70%)	&	3	4.5	3.6	3.7	
98	Ethylamliketon	44500	1	4.6	4.1	3.2	
95	Ethyl acetate	125000	1	4.5	3.3	2.9	
99	Ethyl benzene	140	1	4.9	4.4	3.4	
101	Ethyl di glycol						
104	Ethylenediamin tetraacetic acid sodium salt						
105	Ethyleneglycol	&	1	2	2	1.7	E
106	Ethylenglycol acetate	&	1	3.1	3.9	2.7	
107	Ethyleneglycol monomethyl ester	&	1	2	2	1.7	F
174	Phtalic acid di-ethyl ester	400	3		4.3		C
114	Furfural alcohol	&	3	3.7	2.9	3.2	
124	n-Hexon	50	1				C
125	1-Hexanol	6000	1	4.2	3.9	3.0	
126	2-Hexanol	15000		4.2	3.9		C
127	3-Hexanol	17500		4.2	3.6		C
120	n-Heptan	50	1				C
121	1-Heptanol	1000	3	4.2	4.4	3.9	
122	1-Hepten	a 50	1				C
129	Hydrokinon mono-methyl ester	hs	3		4.5		C
131	Isobutanol	1000	3	3.6	2.8	3.1	
135	Isoprpanol	&	1	3.0	2.1	2.0	
136	Isopropylacetate	18900	1	3.7	3.4	2.7	
137	Isopropylacetone	1900		3.6	3.1		C
142	Caustic bases (Sodium and potassium hydroxite and soda and ammonia solutions)						

Table 2-3 (continued)

Index #	Substance Name	Solu- bility	Acute Oral Toxcty	Acute Toxcty	Acute Toxcty	Danger Level	Expintn.
		Water	Mammal	Bacteria	Fish	Water	
145	Methanol	&	1	2.2	2	1.7	F
150	Methylethylketon	353000	1	2.9	2.3	2.1	
151	2-Methyl furane	s	3	4.1	3.6	3.6	
152	Methylisoamilketon	4500		3.9	3.3		C
154	Methylmetacrylate	15900	1	4	3.5	2.3	
148	2-methyl cyclohexanon	1500	3	4.2	3.3	3.5	
158	Morpholine	&	3	3.5	3.6	3.4	C
160	Nitrol triacetic acid	hs			3.3		
165	n-Octanol	s			4.7		
166	Oxalicacid	95000	3	2.8	3.5	3.1	B
168	2,4-pentadion	125000	3	4.2	3.9	3.7	
22	Potassantinomat	28000	3	2.7	2.8	2.8	
52	Potasschlorate	73000	3	2.7	2.5	2.7	C
169	Potassperchlorate	17000		2.7	2.6		
110	Propioncasate ethyl ester	22000		3.6	3.9		
153	Propioncasate methyl ester	72000		3.5	3.7		C
176	Propanol	&	3	2.6	2.3	2.6	
40	Secondary Tutanol	90000	1	3.3	2.5	2.3	
63	Cyclohexon	50	1				C
64	Cyclonhexanon	24000	1	3.7	3.3	2.7	
65	Cyclohexen	a 50	1	4.8	4.4	3.4	
66	Cyclohexil acetate	s	1	4.1	4.1	3.1	C
61	Cycloheptan	a 50	1				
62	Cyclohepten	a 50			4.3		
68	Cyclopenthanol	s		3.6	2.8		C
69	Cyclopentanon	s	3	3.8	2.5	3.1	
57	Citricacid	700000	3	2	3.1	2.7	
37	Sodiumborate	25000	3	3.0	3.1	3	E
38	Sodiumbromide	90000	1	2.7	2	1.9	
111	Sodiumfluoride	40000	5	3.6	3.2	3.9	
172	Sodiumphosphate	14000	3		2.8		C
138	Sodiumiodate		3	3.2	2	2.7	
182	Sulfate, nitrate phosphate acids						
19	Tertiary amil alcohol	12500	3	3.4	2.6	3	C
43	Tertiary buthyl acetate	1000		4.1	3.4		
45	Tertiary butil benzene				4.2		

Table 2-3 (continued)

Index #	Substance Name	Solu- bility	Acute Oral Toxcty	Acute Toxcty	Acute Toxcty	Danger Level	Exptn.
		Water	Mammal	Bacteria	Fish	Water	
190	Tetrahydrofuron	&	1	3.2	2.6	2.3	C
191	1,2,4,5- Tetra methyl benzene	hs	1		4.5		
196	Tri-n-butyl phos- phate	6000	1	4	5.1	3.4	
202	Triethylene glycol	&	1	3.5	2	2.2	E
197	Trichlor acetic acid	&	1	3	2	2	
200	2,4,5-Trichlor phenocsiacetic acid	278		3			
58	Trimethyl benzene (Cumol)	a 200	1		4.3		C

**Table 2-4****Non-Dangerous and Non-Harmful Substances  
in Water Receptor Mediums  
(WDC1)**

Index	Substance Name	Solubil- ity in H <sub>2</sub> O	Acute Oral Txcty Mamml Level	Acute Txcty Bacter Level	Acute Txcty Fish Level	Danger Level Water	Expln.
6	Acetone	&	1	2.8	2.0	1.9	
96	Ethyl Alcohol	&	1	2.2	1.8	1.7	
116	Glycerin	&	1	<2	<2	<1.7	
201	Triethanolamine	1500	1	<2	<2	<1.7	
118	Urea	1000000	1	<2	<2	<1.7	





<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>HAZARDOUS MATERIALS MANAGEMENT</b> <b>Turkey</b>	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA   C   RMA	<b>REVIEWER COMMENTS:</b>		

(1) LGS (Base Supply) (2) BCE (Base Civil Engineering) (3) Fire Department (4) Safety Officer (5) BEE (Bioenvironmental Engineering) (6) Disaster Preparedness Office (7) LGT (Transportation Officer)

## **Section 3**

# **Hazardous Waste Management**

### Section 3

## HAZARDOUS WASTE MANAGEMENT

### A. Applicability

Since it can be expected that hazardous waste will be produced as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

### B. National Laws and Regulations

- *Water Pollution Control Regulation.* This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution. In addition, it addresses the prevention of hazardous waste from entering wastewater.
- *Communique on Dangerous and Hazardous Substances in Water.* This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water.

### C. State Laws and Regulations

- None available at this time.

### D. Key Compliance Definitions

- *Dangerous and Harmful Waste* - this can include processed by-products, processed waste, non-reactive raw material, used apparatus and installation devices for manufacturing industries, industrial activities and products along with consumer waste, and chemical used in agricultural activities such as pesticides, herbicides, fungicides and insecticides. This also include wastes that are made of dangerous and harmful materials because of the type, amount, and concentration, chemical efficacy, physical condition, mobility, durability, and other similar reasons of the constituents in their contents (Communique on Dangerous and Hazardous Substances, Article 5).

- ***Dangerous and Hazardous Substances*** - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic effects or which are resistant to biological treatment processes, and which, in order not to cause pollution of ground and surface waters, require special treatment or elimination in accordance with the Communiques to be based on this regulation (Water Pollution Control Regulation, Article 2).
- ***Dangerous and Harmful Substances in Water*** - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic or teratogenic effects or which are resistant to biological treatment processes, and which cause pollution of ground and surface waters without special treatment or elimination, and which cause danger to the environment (Communique on Dangerous and Hazardous Materials in Water, Article 2).
- ***Waste*** - waste energy and materials in solid, liquid or gaseous state, resulting from production and consumption activities of all kinds, which may give rise either directly or indirectly to changes in the natural composition and properties of the receptor media with which they mix due to their physical, chemical and bacteriological characteristics, and which affect the potential use of the medium (Water Pollution Control Regulation, Article 2).

**HAZARDOUS WASTE MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	<b>REFER TO WORKSHEET ITEMS:</b>	<b>CONTACT THESE PERSONS OR GROUPS: (*)</b>
All installations	3-1 through 3-7	(1)(2)(3)(4)(5)(6)(8)(9)(10)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Environmental Planning)
- (2) DRMO (Defense and Reutilization Marketing Office)
- (3) Accumulation Point Managers
- (4) Fire Department
- (5) TSD (Treatment, Storage, and Disposal) Facility Officer
- (6) Safety Manager
- (8) Transportation Officer
- (9) Base Supply
- (10) Generating Activities



## **HAZARDOUS WASTE MANAGEMENT**

### **Records to Review**

- Generator (including TSDFs if they are also considered generators):

- Hazardous waste manifests
  - Manifest exception reports
  - Employee training documentation
  - Contingency plan
  - Notifications of hazardous waste oil fuel marketing or blending activity
  - Hazardous waste disposal turn-in document (DD Form 1348-1)

- In addition to the above, TSDFs would be required to have:

- Unmanifested waste reports
  - Facility audit reports (inspection log)
  - Waste analysis plan(s)
  - Operating record
  - Groundwater monitoring records and annual reports
  - Closure/post closure plans
  - Closure/post closure notices (where applicable)
  - Other documents as required by the permit

### **Physical Features to Inspect**

- Disposal sites
- Generating areas
- Accumulation points
- Incinerators
- Vehicles used for transport
- Storage facilities (including drums)

### **Sources to Interview**

- BCE (Environmental Planning)
- DRMO (Defense and Reutilization Marketing Office)
- Accumulation Point Managers
- Fire Department
- TSD (Treatment, Storage, and Disposal) Facility Officer
- Safety Manager
- Transportation Officer
- Base Supply
- Generating Activities





**COMPLIANCE CATEGORY:  
HAZARDOUS WASTE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ALL INSTALLATIONS</b></p> <p><b>3-1.</b> Determine actions or changes since previous review of hazardous waste management (GMP).</p> <p style="text-align: center;">...</p> <p><b>3-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p><b>3-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p> <p><b>3-4.</b> Hazardous wastes that may become dissolved in wastewater or rainwater and then conveyed to groundwater must not be directly stored on the ground within a groundwater feeding basin (Water Pollution Control Regulation, Section 4, Article 22, para G and the Communique on Dangerous and Hazardous Substance, Article 6)</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning hazardous waste management have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p> <p>Verify that hazardous wastes that may be come dissolved in wastewater or rainwater are not directly stored on the ground within a groundwater feeding basin. (1)(2)(3)(5)(10)</p> <p>(NOTE: Major harmful and dangerous waste groups are listed in Table 3-1 . Wastes which are not listed in Table 3-1 but cause ecological and environmental damage under specific conditions such as the limited capacity of the receptor medium and the burden of pollution brought, are understood to be harmful and dangerous wastes.</p> <p style="text-align: center;">...</p>

(1) BCE (Environmental Planning) (2) DRMO (Defense and Reutilization Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSD (Treatment, Storage, and Disposal) Facility Officer (6) Safety Manager (8) Transportation Officer (9) Base Supply (10) Generating Activities

**COMPLIANCE CATEGORY:  
HAZARDOUS WASTE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>3-5.</b> Wastes containing substances of the classes STS3 and STS4 must be stored as required by the <i>Communiqué on Dangerous and Hazardous Substances</i> (Water Pollution Control Regulation, Section 4, Article 22, para H and the <i>Communiqué on Dangerous and Hazardous Substances</i>, Annex 1).</p> <p style="text-align: center;">...</p>	<p>Determine if the installation has wastes containing STS3 or STS4 classed substances, see Tables 3-2 and 3-3. An explanation of letter codes used in Table 3-2 and 3-3 can be found before Table 3-2. (1)(2)(3)(5)(10)</p> <p>Verify that they are stored correctly.</p> <p style="text-align: center;">...</p>
<p><b>3-6.</b> All storage tanks for special wastes must be constructed in such a way to prevent seepage from contaminating the groundwater (Water Pollution Control Regulation, Section 4, Article 22, para I).</p> <p style="text-align: center;">...</p>	<p>Verify that tanks are constructed to prevent seepage. (1)(2)(3)(5)(10)</p> <p style="text-align: center;">...</p>
<p><b>3-7.</b> In order to prevent pollution of groundwater during an accident involving hazardous waste, spill cleanup materials are required to be available (Water Pollution Control Regulation, Section 4, Article 22, para N).</p> <p style="text-align: center;">...</p>	<p>Verify that spill cleanup materials are available at hazardous waste storage sites. (1)(2)(3)(4)(5)(6)(8)(9)(10)</p> <p style="text-align: center;">...</p>

(1) BCE (Environmental Planning) (2) DRMO (Defense and Reutilization Marketing Office) (3) Accumulation Point Managers (4) Fire Department (5) TSD (Treatment, Storage, and Disposal) Facility Officer (6) Safety Manager (8) Transportation Officer (9) Base Supply (10) Generating Activities

**Table 3-1**

**List of Dangerous and Harmful Wastes  
(Communique on Dangerous and Harmful Substances, Annex 2)**

1. **Radioactive Wastes**
2. **Toxic heavy metal and wastes including compounds (mercury and its compounds, cadmium and its compounds, zinc, copper, barrium, lead, nickel, chrome, titanium, silver, cobalt, antimony, tin, vanadium, molybdenum, beryllium, thalium, uranium and its compounds of similar make up)**
3. **Wastes that containing cyanide, are occured during the process of hardening and the reaction with heat, and those wastes containing inorganic cyanide.**
4. **Wastes occured during the formulation, production, and use of organic solvents (organic solvents with halogen are mentioned separetly.)**
5. **Organic halogen compounds, and wastes containig those compounds**
6. **Organic phoshor compounds, and wastes containig those compounds**
7. **Organic tin compounds, and wastes containing those compounds**
8. **Alkyl mercury compounds, and wastes containing those compounds**
9. **Organic silicon compounds, wastes containig those compunds, and substances can form those kind of compounds in water medium**
10. **Wastes containing inorganic compounds except calcium floride**
11. **Wastes formed during the formulation and production of fitofarmosit! and biyosid!**
12. **Wastes and pieces containing or contaminated by polychlorinated biphenyls (PCB) and/or polychlorinated tophenyls (PCT) and/or polybrominated biphenyls (PBB)**
13. **Used and residual oils, hydrocarbons, and their emissions and mixture with water.**
14. **Wastes formed during the preparation and production of the pharmostic! products**
15. **Pharmostic, medicine, pharmacy, and laboratuar wastes**
16. **Tar waste residual formed from refining, distillation and any pyroltic process.**
17. **Wastes containing asbestos (amiant) (as if dust or fibre)**
18. **Selenium and tellurium compounds, and wastes containing those compounds**
19. **Arsenic, arsenic compounds, and wastes containing those compounds**
20. **Bor, bor compounds, and wastes containing those compounds**

**Table 3-1 (continued)**

21. Acidic or basic characteristic wastes formed by conducting surfaces of the metallic or plastic substances
22. Fusion wastes of the metals excepting aluminium, magnesium, and iron
23. Filter material waste (contaminated kieselguhr) used in chemical industry
24. Wastes containing those mercaps
25. Wastes containig etheric compounds
26. Detergents that are biologically non-fissionable and surface active materials
27. Acidic solutions and wastes containing acids
28. Basic solutions and wastes containig basics
29. Wastes of hospitals, clinics, and medical centers
30. Wastes formed during the formulation, production, and use of ink, paint, pigment, oil colour, and like products
31. Wastes formed during the formulation, production use of colophanies, latex, materials causing plasticity, and glutinous materials
32. Wastes formed from the formulation, production, and use of chemical substances releated to photography and its processed materials
33. Any substances contaminated by any compunnd class of polychlor dibenzo-furan
34. Phenols and phenol compounds, and waste containing those compounds
35. Any substances contaminated by compound class of polychlor dibenzo-p-dioxin
36. Organic halogen compound waste remaining outside of the substances mentioned in this list
37. New or/and improper Chemical substance waste whose effects on human being and environment unknown sourced through the activities of reseach, development, and education
38. Wastes which are not subjected to other legal arrangments have the inflammable and explosive character ( peroxide, perchloride, chloride, azides, ethers, and similar compounds )
39. Wastes are in the condition of complete mixing or partial mixing with the substances in this list

## Letter Codes Used in Tables 3-2 and 3-3

### General Explanations:

A: Carcinogenic substances

B: Likely carcinogenic substances

C: In the conditions of being barely dissolved in water making it impossible to calculate its danger limit in water by other reasons, substances are classified by conjecturing the degree to which dangers affect water.

D: Substances with the strong possibility of accumulating

E: Substances that are found close to the limit level are taken place in a higher WDC class.

### Explanation of symbols used in solubility of substances in water.

s : soluble

hs: hardly soluble

ls : less soluble

&: soluble in any portion

a : approximately



Table 3-2

**Dangerous and Harmful Substances Classified as STS 4**  
 (Communique on Dangerous and Harmful Substances, Annex 1, Table 4)

Index #	Substance Name	Water Solu-bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac-terias	Acute Toxcty Fish	Danger # Water	Explntns.
9	Acryolin	265000	5	6.7	5.6	5.8	
14	Allilamin	&	5	3.2	4.2	4.1	
20	Anilin	34000	3	3.9	4.2	3.7	F
21	Anisol	hs	5		3.9		C
1	Acetalydhyde	&	3		3.9		C,F
5	Acetateacid methylesther	350000					F
8	Acetonitril	&	1	3.2	2.2	2.1	
24	Atrazene	70	1		4.5		C
141	Copperdisulfate	s	3	7.5	6.1	5.5	
33	Benzelchloride	hs	3	5.3	5.5	4.6	
31	Benzonitril	hs	5	5.0	4.0	4.7	
34	Beryliumnitrate	s	1	7.7	4	4.2	A
76	1,2 diethylbenz	200	3		4.5		C
74	2,4 dichlorbenz	150	3	4.8	4.5	4.1	
75	2,3 dichlorphenl	4,500	3	5.2	5.3	4.5	C
82	2,4 dimethylanln	hs	3	5.1	3.7	3.9	E
73	Di-n-butilate	s			4.2		C
84	1,3 dinitrobenz	650	5	4.9	5	5	
85	Dinirbutolphenol	50	5		5.7		C,F
103	Ethyl diamine	&	3	6.1	3.4	4.2	
109	2-ethyl hexsilam	s	3	4.1	4.8	4.0	
102	ethyline chlorid	8650	3	3.9	3.5	3.5	
171	Phenylacetate	1000	3	3.9	4.9	3.9	E
170	Phenol	82000	3	4.2	4.6	3.9	E
173	Phtalicaciddiaslt	hs	3	4	6.4	4.5	
112	Formaldehyde 35% by volume soluble	s	3	4.9	4.0	4.0	
119	Fuel Oil(163/345)	5	1				C
113	Furfurol	83000	5	4.8	4.5	4.8	
115	Gasoil(172/323)	5	1				C
117	Glycacid butol est	46000					F
123	Hexachlorbutane	hs	3				E
128	Hydroquinone	72000	3	4.2	6.8	4.7	
134	Isooctanol	s		4.2	4.6		C
50	Karbaril	<1000	3		4.7		C,F
189	Carb tetra chloride	770	1	4.5	4.0	3.2	
139	Kerosene (158/246)	10	1				C

Table 3-2 (continued)

Index #	Substance Name	Water Solu- bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac- terias	Acute Toxcty Fish	Danger # Water	Expintns.
51	Chlorhydrate	&	3	5.8	2.8	3.9	E
53	Chlorbenzene	490	1	4.8	7.7	4.2	
157	Chlor phen metox methyolate	580	1	5	4.1	3.4	
54	Choloroform	8200	1	3.9	3.8	2.9	B
55	2-Chlortoluene	hs	1	4.8	4.1	3.3	
140	m-Cresole	31000	3	4.3	4.7	4.0	
206	Xylene	200	3		4.1		C,F
59	Kumo <sup>1</sup> Hydrperox	hs	3		4.9		C
35	Lead 2-acetate	s	1	5.7	3.2	3.3	D,F
183	Carbon Sulfate(CS <sub>2</sub> )	2200	3		4.0		C
76	Diesel(161/334)	5	1				C
147	Methyl acrylate	60000	5	4.3	5.1	4.8	
145	Methy acetate	292000					F
149	Metylene chloride	20000	1	3.3	3.3	2.5	
155	Mineral turpentine	20	1				C
156	Monoflor acetic acid		7	4.2	3.6	4.9	
159	Nickel chlorate	550000	5	8.5	3.2	5.6	B
132	Nitrilisobutirate	ls	5		3.6		C
162	4-Nitroaniline	600	3	5.4	4.5	4.3	
163	Nitrobenzene	1900	3	5.2	4.2	4.1	
164	2-Nitrotoluene	a 40	3	4.7	4.5	4.1	
27	Petrolether(40/71)	50	1				C
28	petrolether(61/135)	40	1				C
175	Picratacid (50% soluble)	&	5	3.0	3.5	3.8	E
179	Pridine	&	3	3.5	3.6	3.4	F
177	2-Propinol-1	1	5	3.8	5.7	4.8	
181	Salycilaldehyde	1700	3	5.0	5.4	4.5	
67	Cyclohexilamine	s	5	3.4	3.7	4.0	
56	Sodiumdichromate	s	3	6.1	3.7	4.3	A
161	Sodiumnitrate	s	7	3.9	3.5	4.8	
184	Sodiumselenite	a s	7	4.7	4.0	5.2	
188	Sodiumsulfur	180000	7	5.8	4.6	5.8	
186	Naphta solvent	(186/210)	15	1			C
187	Styrene	320	1	4.1	4.8	3.3	F
192	Thallium 1-nitrate	96000	5		3.7		C
194	Toluene	470	1	4.5	4.2	3.2	F
195	O-Toludine	15000	3	4.8	3.9	3.9	B,E
198	1,1,1-Trichlorethane	1300	1	4.0	3.9	3.0	
199	Trichlorethylene	1000	1	4.2	3.9	3.0	B
203	Vinyl acetate	20000	1	5.2	4.6	3.6	F
204	VKNormal	160	1		4.4		C
205	VKSuper	380	1		5.7		C



**Table 3-3**

**VERY DANGEROUS AND HARMFUL SUBSTANCES  
FOR WATER RECEPTOR MEDIUMS  
(WDC 4)**

Index #	Sub- stance Name	Water Solu- bility	Acute Oral Toxicity Mammals	Acute Toxicity # Bacteria	Acute Toxicity # Fish	Danger # H <sub>2</sub> O	Expltnts.
10	Acrylnotrill	s	5		4.6		A,C
7	Acetone Cyanhydr		7		5.8		C
29	Benzine	1	1800	4.0	4.5	3.2	A
180	Merc(2)chloride	s	5	8	6.3	6.4	
70	p-p'- DDT	0.0012	5				C,D
23	Disodhyrgarsnt	s	5	4.7	4.0	3.9	A
92	Epi Chlorhidrin	hs	5	4.3	4.6	4.6	A
167	Ethyl Paration	24	7		6.3		C,F
108	Ethyl Imino	&	7	5.3	5.7	6.0	A
185	Silver Nitrate	2.1mln	5	8.2	6.4	6.5	
130	Hydrg. hydroxst		7	7.7	6.1	6.9	A
49	Cadm. Nitrate	s	3	7.1	4.2	4.8	
35	Lead Tetra Eth	300					
143	Linden	10	5		6.6		C
144	Merkaptan						F
60	Sodmcynate	s	7	9	7.2	7.7	



<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>HAZARDOUS WASTE MANAGEMENT</b> <b>Turkey</b>	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Environmental Planning) (2) DRMO (Defense and Reutilization Marketing Office) (3) Accumulation Point Managers  
(4) Fire Department (5) TSD (Treatment, Storage, and Disposal) Facility Officer (6) Safety Manager (8) Transportation Officer  
(9) Base Supply (10) Generating Activities

## **Section 4**

### **Natural and Cultural Resources Management**

## Section 4

### NATURAL AND CULTURAL RESOURCES MANAGEMENT

#### A. Applicability

This protocol applies to all U.S. Air Force installations in Turkey, and is based on Turkish laws and regulations.

The *Water Products Law* (Law No. 1380 of 22 March 1971) addresses issues related to the protection, manufacturing, and management of water products; in that context it also proscribes certain methods used in hunting.

The *Forestry Law* (Law No. 6831 of 31 August 1956) addresses a number of issues relevant to the management of forests.

#### B. National Laws and Regulations

- *Law No. 2872 of 11 August 1983.* This Law establishes the requirements for evaluating the environmental impact of activities.
- *Law No. 2863 of 21 July 1983.* This Law, the *Law for the Protection of Natural and Cultural Resources* was published in the *Official Gazette* as No. 18113 on 23 July 1983. The purpose of this law is to determine the definitions related to mobile and non-mobile cultural and natural resources required to be protected, to arrange processes and activities to be carried out, and to establish the duties and structure of the organization which will take the decisions regarding the principles and applications necessary for this matter.

#### C. State Laws and Regulations

- None identified at this time.

#### D. Key Compliance Definitions

- *Cultural Resources* - are whole mobile and non-mobile resources found on the land, underground, and underwater and relevant to history and historical cycles of science, culture, religion, and art (Law No. 2863, Article 3).

- ***Ecological Balance*** - the totality of the conditions required for the survival and development of human and other living beings (Law No. 2872, Article 2)
- ***Environmental Pollution*** - the imbalance brought about in the ecological conditions as a result of untoward effects of pollution in the air, land, and water caused by man's activities as well as the undesired consequences thereof, like nasty odors, noises and wastes (Law No. 2872, Article 2).
- ***Natural Resources*** - are the values found on the land, underground, and underwater and required to be protected because of belonging to the geologic cycle, pre-history and historical cycle, and that are rare for their properties and beauty (Law No. 2863, Article 3).
- ***Polluting Agents*** - physical and legal persons causing directly or indirectly the said environmental pollution (Law No. 2872, Article 2).
- ***Preservation of Environment*** - the preservation of the ecological balance, the avoidance and the pollution of air, land, and water, and the perpetuation of the existing welfare, and all the activities oriented to said purpose (Law No. 2872, Article 2).
- ***Protected Area*** - are the areas that must be protected by carrying out protection measures within the historical environment, or within the context of cultural and natural resources conservation (Law No. 2863, Article 3)
- ***Protecting and Protected*** - are the processes of safeguarding looking after, repairing, restoring, and converting non-mobile cultural and natural resources; are the works of safeguarding, looking after, repairing and restoration in the mobile cultural resources (Law No. 2863, Article 3).
- ***Site*** - are the areas required to be protected because of important historical events that occurred in those areas; and sites are the cities and remains of cities, which reflects the social, economic, architectural, and similar properties of the past historical times, and the product of the various civilizations from pre-history to the present (Law No. 2863, Article 3).

## NATURAL AND CULTURAL RESOURCES MANAGEMENT

### **GUIDANCE FOR CHECKLIST USERS**

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	REFER TO WORKSHEET ITEMS	CONTACT THESE PERSONS OR GROUPS(*)
All installations	4-1 through 4-3	(1)(2)
Natural and cultural resources management	4-4 through 4-6	(2)
Hunting	4-7 through 4-14	(1)
Additional provisions	4-15 and 4-16	(2)

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#### **(\*) CONTACT/LOCATION CODE:**

- (1) Natural Resources Manager (or Environmental Coordinator)
- (2) Historic Preservation Officer (or Environmental Coordinator)





## **NATURAL AND CULTURAL RESOURCES MANAGEMENT**

### **Records to Review**

- For construction activities: documentation of finding of no adverse effect
- Environmental Impact Statement
- Installation Master Plan
- Land Use Plan
- Historic Preservation Plan
- Fish and Wildlife Plan
- Outdoor Recreation Plan
- Cropland and Grazing Plan
- Forest Management Plan

### **Physical Features to Inspect**

- Construction sites
- Site or landmark of historic or archaeological interest
- Facilities constructed in the past 2 years
- Wildlife containment areas
- Wildlife habitat, and land and water resources
- Equipment which could damage wildlife, its habitat, or land and water resources

### **Sources to Interview**

- Natural Resources Manager (or Environmental Coordinator)
- Historic Preservation Officer (or Environmental Coordinator)



**COMPLIANCE CATEGORY:  
NATURAL AND CULTURAL RESOURCES MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ALL INSTALLATIONS</b></p> <p><b>4-1.</b> Determine actions or changes since previous review of natural and cultural resource management (GMP).</p> <p style="text-align: center;">...</p> <p><b>4-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p><b>4-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <ul style="list-style-type: none"> <li>- Law No. 2872, 11 August 1983</li> <li>- Law No. 2863, 21 July 1988.</li> </ul> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning natural and cultural resources management have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p>
<p><b>NATURAL/CULTURAL RESOURCES MANAGEMENT</b></p> <p><b>4-4.</b> People who find mobile or non-mobile resources, people who own the land or use this land and know that there is a cultural or natural resources on the land, or who have informed that there is, must inform the closest museum directorate, or must inform the village chief (Law No. 2863, Section 1, Article 4).</p> <p style="text-align: center;">...</p>	<p>Determine if the installation has any cultural resources or natural resources that have not been reported. (2)</p> <p>(NOTE: If those resources are found in the military bases and in the forbidden zones, they are made known to the chain of command according to systematic principles.)</p> <p style="text-align: center;">...</p>

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)

**COMPLIANCE CATEGORY:  
NATURAL AND CULTURAL RESOURCES MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>4-5.</b> The installation is required to protect specific types of non-mobile and mobile cultural and natural resources (Laws No. 2863, Section 2, Article 6).</p> <p style="text-align: center;">...</p>	<p>Verify that the following natural and cultural resources are protected: (2)</p> <ul style="list-style-type: none"> <li>- natural resources that are non-mobile and built before the end of the 19th century</li> <li>- non-mobiles that were built after the date mentioned are considered required to be protected by their importance and special features (NOTE: It is the Ministry of Culture and Tourism that is responsible for seeing to it that these structures are taken care of.)</li> <li>- non-mobile cultural resources located within site areas</li> <li>- homes used by Mustafa Kemal Atatürk with areas to be established and buildings that were the scene of great historical events of the National Struggle and the founding of the Turkish Republic without the factor of time being important or registration of these places in Turkish national history.</li> </ul> <p>(NOTE: Non-mobile resources that are not protected because of their architectural, historical, aesthetic, archaeological, and other importance and particular properties are not counted as non-mobile cultural resources required to be protected by Higher Commission.)</p> <p>(NOTE: The following are examples of monumental cultural resources: stone tombs, tombs with pictures, writing, relief, mounds, small mounds, ancient ruins, acropolises, necropolises; forts, castles, towers, walls, historical barracks, bastions, fortifications and permanent weapons in places; ruins, caravanserais, inns, bath houses, medresses; vaults (domes, arches), mausoleums, and inscriptions; bridges aqueducts, water conduits, cisterns, wells; historical road ruins, interval rocks (for road measurements), stones with holes that established the old borders, monuments, ceramic mugs or dippers, dockyards, dikes, historical places, villas, beach houses, resting place; mosques, temples, coffin area and stones; fountains, soup kitchens for poor, mint, lunatic asylum, clock room, silver wire house, dervish house, hermit's lodge; graves, mosque graveyards, arastalar, bedestens (no Engl. equivalent—building of a market for storing precious goods), covered shopping districts, sarcophagi, siteller, synagogues, basilica, churches, monasteries, kulliyeler (untranslatable—basically a collection of buildings, including a school and an insane asylum), old monuments and remnants of walls; frescoes, graves, mosaics and similar monuments.)</p> <p>(NOTE: The following are examples of natural monuments: historical caverns, stone shelters; uniquely designated trees and tree clusters with similar items.)</p> <p style="text-align: center;">...</p>

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)

**COMPLIANCE CATEGORY:  
NATURAL AND CULTURAL RESOURCES MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>4-6.</b> If there is an obligation to transport non-mobile cultural resources and their fragments to a different place or it is necessary to transport them because of their characteristics, transportation must be done by the Culture and Tourism Ministry (Law No. 2863, Section 2, article 20)</p> <p style="text-align: center;">...</p>	<p>Verify that all transportation of non-mobile cultural resources is done by the Culture and Tourism Ministry, not by the installation. (2)</p> <p style="text-align: center;">...</p>
<p><b>HUNTING</b></p>	
<p><b>4-7.</b> The hunting of certain animals is permitted only at specific times of the year (Territorial Hunting Law, Article 2).</p> <p style="text-align: center;">...</p>	<p>Verify that the hunting of the animals listed in Table 4-1 is prohibited on the installation from April through July. (1)</p> <p style="text-align: center;">...</p>
<p><b>4-8.</b> The hunting of certain animals is prohibited (Territorial Hunting Law, Article 2).</p> <p style="text-align: center;">...</p>	<p>Verify that the hunting of the animals listed in Table 4-2 is prohibited on the installation. (1)</p> <p style="text-align: center;">...</p>
<p><b>4-9.</b> The Agriculture Ministry and the Hunting Commission have the power to regulate or prohibit the hunting of animals not mentioned above, and may halt hunts at any time (Territorial Hunting Law, Articles 3 and 5).</p> <p style="text-align: center;">...</p>	<p>Determine whether the Agriculture Ministry or Hunting Commission has issued additional regulations concerning hunting. (1)</p> <p>Verify that the installation is prepared to enforce any such regulations.</p> <p style="text-align: center;">...</p>
<p><b>4-10.</b> Official permission is required to hunt for purposes of scientific research, or to hunt protected species (Territorial Hunting Law, Article 6).</p> <p style="text-align: center;">...</p>	<p>Verify that hunting for scientific research and the hunting of protected species, except by permission of the Agriculture Ministry, is prohibited on the installation. (1)</p> <p style="text-align: center;">...</p>

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)

**COMPLIANCE CATEGORY:  
NATURAL AND CULTURAL RESOURCES MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>4-11.</b> Hunting is prohibited in certain protected areas (Territorial Hunting Law, Article 6).</p> <p style="text-align: center;">...</p>	<p>Determine whether any parts of the installation are: (1)</p> <ul style="list-style-type: none"> <li>- areas where game animals reproduce</li> <li>- areas set aside to improve conditions for game animals</li> <li>- areas where game animals are protected</li> <li>- at the edge of trenches or similar structures</li> <li>- areas where animals may be breeding, such as meadows where clover is grown.</li> </ul> <p style="text-align: center;">...</p>
<p><b>4-12.</b> The hunting of the young and eggs of animals is prohibited in certain areas (Territorial Hunting Law, Article 7).</p> <p style="text-align: center;">...</p>	<p>Determine whether any areas of the installation are designated as orchards or gardens. (1)</p> <p>Verify that the hunting of the young and eggs of animals is prohibited in such areas.</p> <p>Verify that the sale of eggs taken in such areas is prohibited.</p> <p style="text-align: center;">...</p>
<p><b>4-13.</b> The hunting of dangerous and poisonous animals is subject to specific restrictions (Territorial Hunting Law, Article 9).</p> <p style="text-align: center;">...</p>	<p>Verify that no attempt is made to hunt dangerous or poisonous animals to extinction. (1)</p> <p style="text-align: center;">...</p>
<p><b>4-14.</b> Certain methods of hunting are prohibited (Water Products Law, Article 19).</p> <p style="text-align: center;">...</p>	<p>Verify that none of the following methods of hunting are used on the installation: (1)</p> <ul style="list-style-type: none"> <li>- bombs, torpedos, dynamite, and similar explosive materials</li> <li>- poisons, narcotics, limestone</li> <li>- electric current, electric shock, or air pressure.</li> </ul> <p style="text-align: center;">...</p>

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)

**COMPLIANCE CATEGORY:  
NATURAL AND CULTURAL RESOURCES MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ADDITIONAL PROVISIONS</b></p> <p><b>4-15.</b> Certain activities are prohibited within the boundaries of state forests (Forestry Law, Article 14).</p> <p style="text-align: center;">...</p> <p><b>4-16.</b> Trees that are to be cut or that have fallen must be marked and accounted for through registration, transportation, production, and sale (Forestry Law, Article 27).</p>	<p>Determine whether the installation or parts of it lie within the boundaries of a state forest. (1)</p> <p>Verify that the following activities do not take place within the boundaries of a state forest: (1)</p> <ul style="list-style-type: none"> <li>- pulling out or cutting out saplings or destroying the areas in which they grow</li> <li>- choking or injuring living trees, cutting their branches or tops, or stripping their bark</li> <li>- cutting live standing trees or dead trees; uprooting trees, removing bark, tar, or gum; cutting or removing damaged and fallen trees; burning trees to make charcoal</li> <li>- collecting and removing valonia oak, linden flower, any kind of forest cover, gall nut (<i>Thuya orientalis</i>), medicinal or industrial plants, or seeds</li> <li>- hunting by poisoning or dynamiting lakes, pools, dams, or streams in the forest</li> <li>- removing soil, sand, or gravel for private use or non-commercial purposes.</li> </ul> <p style="text-align: center;">...</p> <p>Verify that trees that are to be cut or that have fallen are marked and accounted for through registration, transportation, production, and sale. (1)</p>

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)





**Table 4-1**

**Species of Animals whose Hunting is Prohibited from April through July**

**Species of Mammals**

- wild cats
- wild horses
- skunks
- squirrels
- marten
- gazelle
- weasels
- badgers
- beaver
- rabbits
- foxes
- deer
- mountain goats
- bears
- otters

**Species of Birds**

- partridges
- wild cocks
- male pheasants
- peacock family
- grouse family
- quail family
- wild ducks
- golden oriole
- swans
- woodcocks
- cranes
- bustards
- ravens
- marsh birds



**Table 4-2**

**Animals whose Hunting is Prohibited**

**Species of Mammals**

- roe deer
- mountain sheep
- young of mountain goats
- bats
- hedgehogs

**Species of Birds**

- francolin
- domesticated doves
- kestrels
- goldcrest kinglet
- cuckoo
- woodpecker
- goatsucker
- nightjar
- starlings/martins
- swallows
- storks
- eagle owls
- starlings



<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> Natural And Cultural Resources Management Turkey	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) Natural Resources Manager (or Environmental Coordinator) (2) Historic Preservation Officer (or Environmental Coordinator)

## **Section 5**

### **Environmental Noise Management**

## Section 5

### ENVIRONMENTAL NOISE MANAGEMENT

#### A. Applicability

Since it can be expected that noise will be produced as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations. This section does not address occupational noise, only environmental noise.

#### B. National Laws and Regulations

- *Noise Control Regulation*. This regulation, effective as of 11 December 1986 and published in the *Official Gazette* number 19308, is to create an environment in which noise will not disturb the repose and peace and the physical and mental health of human beings. The highest official of the central government, the municipalities, and the legal entities in the villages are responsible for implementation of this regulation in areas under their jurisdiction.

#### C. State Laws and Regulations

- None available at this time.

#### D. Key Compliance Definitions

- *Acoustic Shadow Zone* - an area in which sound levels are reduced by up to 10-15 dBA; this is achieved when the sound waves propagated in an environment undergo blocking or diffraction as a result of such external effects as obstacles, wind, and daily temperature fluctuations (Noise Control Regulation, Section 1, Article 4).
- *Background Noise* - a continuous background noise created simultaneously by sources of noise other than the noise source being examined in an environment (Noise Control Regulation, Section 1, Article 4).
- *dBA* - the unit of measuring sound with particular emphasis on the medium and high frequencies to which the human ear is the most sensitive. The dBA unit, which is frequently used in noise reduction and control, is related to the subjective perception of sound (Noise Control Regulation, Section 1, Article 4).

- **Environmental Measures** - noise control of all kinds that can be undertaken in an environment where sounds arising from indoor or outdoor noise sources are propagated until they reach buildings or users inside them (Noise Control Regulation, Section 1, Article 4).
- **Equivalent Noise Level ( $L_{eq}$ )** - a noise criterion in dBA giving the average level of sound energy or sound pressure exhibiting continuity within a given period. It is represented by the symbol  $L_{eq}$  and calculated as follows:

$$L_{eq} = 10 \log \frac{1}{n} \sum_{i=1}^n 10^{L_i/10}, \text{ dBA}$$

where  $n$  = number of noises  $L_i$  = noise levels, dBA (Noise Control Regulation, Section 1, Article 4).

- **Frequency** - the Hertz is the unit of frequency, that is, the number of vibrations of a sound wave per unit time (Noise Control Regulation, Section 1, Article 4).
- **Frequency Spectrum** - the graph produced following the analysis of sound pressure levels pertaining to sound waves of different frequencies, as in noise (Noise Control Regulation, Section 1, Article 4).
- **Impact Noise** - the noise produced by two masses striking each other (Noise Control Regulation, Section 1, Article 4).
- **Indoor Noise Levels** - noise levels measured or calculated in spaces where various activities take place indoors (Noise Control Regulation, Section 1, Article 4).
- **Maximum Noise Level** - the highest level that sound, which fluctuates with time, has at any given moment (Noise Control Regulation, Section 1, Article 4).
- **Measures At The Noise Source** - measures that may be implemented in connection with the structure of the noise-producing source of sound, the mode of operation, the ground where it is situated, the way it is mounted, or similar measures relating directly to the source itself (Noise Control Regulation, Section 1, Article 4).



- *Noise* - a sound spectrum with an arbitrary structure which is defined subjectively as an unwanted sound (Noise Control Regulation, Section 1, Article 4).
- *Noise Certificate* - a certificate regarding the noise produced by aircraft, issued by the International Civil Aviation Organization and confirming their compliance with the criteria (Noise Control Regulation, Section 1, Article 4).
- *Noise Control* - the process of eliminating altogether or reducing to a reasonable level sounds in the nature of noise emitted from a sound source of any kind by reducing them to an acceptable level, modifying their acoustic properties, shortening their effective duration, or masking them with a pleasant or less annoying sound. Noise control may be effected either at the noise source, in the environment where the noise is propagated, or at the user affected by the noise (Noise Control Regulation, Section 1, Article 4).
- *Noise Effects* - the effects of noise on human health and comfort, which may be divided into four groups:
  - physical effects in the form of impaired hearing
  - physiological effects on bodily functions
  - psychological effects such as discomfort and irritability
  - effects on performance, such as reduced work efficiency and the inability to understand sounds heard (Noise Control Regulation, Section 1, Article 4).
- *Noise Index (WECPNL)* - a unit envisaged by the International Civil Aviation Organization (ICAO) for use in evaluating the noise of aircraft at and in the immediate vicinity of airports. As a calculation it includes the type of airplane, the frequency spectrum of the noise, the duration of the flyover, and daily flight intensity (Noise Control Regulation, Section 1, Article 4).

$$\text{WECPNL: } 10 \log \left[ \begin{matrix} 5 \\ - \text{antilog} \\ 8 \end{matrix} \frac{\text{ECPNLD}}{10} + \begin{matrix} 3 \\ - \text{antilog} \\ 8 \end{matrix} \frac{\text{ECPNLN} = 10}{10} \right] + S$$

ECPNLD: Day ECPNL (07-22)

ECPNLN: Night ECPNL (22-07)

S: Seasonal adjustment factor (between -5 and +5 dB)

$$\text{ECPNL: } 10 \log \sum \text{antilog} \frac{\text{EPNL (n)}}{10} + 10 \log \frac{\text{To}}{\text{to}} - 10 \log \frac{\text{T}}{\text{to}}$$

**EPNL: Effective perceived noise level**

**n: number of noise incidents**

**T: evaluation time**

**To, to: constants determined by the characteristics of the measurement.**

- **Noise Reduction Coefficient (NRC)** - a unit which is important in the perception of speech and which gives average sound absorption coefficients of materials in a frequency range between 250 and 2000 Hz:

$$\text{NRC} = \frac{a_{250} + a_{500} + a_{1000} + a_{2000}}{4}$$

**alpha: sound absorption coefficient (0.0 - 1.0).**

**(Noise Control Regulation, Section 1, Article 4).**

- **Noise Sensitive Areas And Uses** - buildings on public or privately owned property which, owing to the activities taking place inside them, must be protected from excessive noise either because their acoustics necessitate it, or because discomfort from outdoor noise is at a maximum, or in order that desirable sounds can be heard optimally. Such places as residences, hospitals, schools, motels, pensions [boarding houses], rest facilities, recreational parks and cemeteries can be divided into areas of extreme and normal noise sensitivity (Noise Control Regulation, Section 1, Article 4).
- **Outdoor Noise Levels** - noise levels measured or calculated outdoors at a distance of 1.00 m from the exterior walls of buildings (Noise Control Regulation, Section 1, Article 4).
- **Peak Level** - see Maximum noise level.
- **Physical Environment Factors** - noise-enhancing or -reducing elements of all kinds which are found in the physical environment through which the sound passes as it is transmitted from the source to the user, building or affected persons and which affect the propagation of the sound (Noise Control Regulation, Section 1, Article 4).
- **Reverberating Courtyard** - a form of courtyard which causes multiple reflection of sounds off perpendicular surfaces, such as opposite walls, giving rise to an echo and an increased amount of noise (Noise Control Regulation, Section 1, Article 4).

- **Reverberation Time** - a criterion for determining the acoustical properties of a space; the period of time in seconds that elapses from the cessation of a source of sound within a space until the sound level falls to 60 dB (Noise Control Regulation, Section 1, Article 4).
- **Sound** - a physical phenomenon produced when waves caused by air pressure from a vibrating source stimulate a human being's sense of hearing (Noise Control Regulation, Section 1, Article 4).
- **Sound Absorption** - conversion of the energy in a sound wave striking the surface of a structural element into heat energy due to friction in the element's pores and, therefore, a reduction in the sound energy reflected from that surface (Noise Control Regulation, Section 1, Article 4).
- **Sound Insulation** - measures of all kinds that can be taken in the construction of the structural elements and in the materials and components used in order to reduce the amount of sound transmitted by the structural elements; in other words, to increase their sound conductivity loss (Noise Control Regulation, Section 1, Article 4).
- **Sound Pressure Level or Noise Level** - the difference between atmospheric pressure, which varies during transmission of sound, and equilibrium pressure. The decibel (dB) is the unit of sound pressure level proportional to the standard reference sound pressure level of  $0.0002 \text{ Newton/m}^2$ . The decibel is the unit of perceived sound intensity such that a given sound is said to be a number of decibels above the minimum audible intensity equal to 10 times the logarithm to the base 10 of the intensity of that sound in absolute units divided by the minimum audible intensity. Ten decibels equal one bel. Sound intensity level is defined in the following way:

$$L_p = 10 \log \frac{(P)^2}{P_o} = 20 \log \frac{(P)}{P_o}$$

where  $L_p$  = Level of sound intensity (dB)  $P$  = Sound pressure ( $\text{N/m}^2$ )  $P_o$  = Reference sound pressure ( $2 \times 10^{-4} \text{ N/m}^2$  according to TS 187) (Noise Control Regulation, Section 1, Article 4).

- **Sound Transmission Coefficient** - the basic unit of measuring the sound insulation of a structural element; sound intensifies reaching the surface of a structural element are different from those transmitted to the back of it; when this difference is determined by a logarithmic criterion, it is called sound conductivity loss or sound transmission loss. The unit is the decibel. Transmission losses vary depending on the characteristics of the structural element and the frequencies of the sounds (Noise Control Regulation, Section 1, Article 4).

- *Vibration* - in general, low frequency, high amplitude mechanical vibrations which are propagated in solid media and experienced through the sense of touch (Noise Control Regulation, Section 1, Article 4).
- *Vibration Impact Threshold* - the threshold of damage to structures due to the physiological and psychological effects of vibrations, such as motion sickness, which affect human health, performance and comfort, and the criteria of which are expressed in terms of the rate, acceleration, amplitude, frequency and duration of the vibration (Noise Control Regulation, Section 1, Article 4).

**ENVIRONMENTAL NOISE MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	5-1 through 5-3	(1)(2)
Vehicle noise	5-4 through 5-6	(1)
Residential noise	5-7 and 5-8	(1)(3)
Construction concerns	5-9 through 5-14	(1)(3)
Building noise	5-15 through 5-17	(1)(3)
Miscellaneous noise	5-18 through 5-27	(1)(3)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Base Civil Engineering (Environmental/Community Planning))
- (2) Deputy for Operations (Air Space Manager)
- (3) Public Affairs Office



## **ENVIRONMENTAL NOISE MANAGEMENT**

### **Records to Review**

- Facility Master Plan Document
- Complaint log from local community

### **Physical Features to Inspect**

- Power generators or other noise
- Emergency generators
- Test tracks

### **Sources to Interview**

- BCE (Base Civil Engineering (Environmental/Community Planning))
- Deputy for Operations (Air Space Manager)
- Public Affairs Office
- Range Operating Agency





**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ALL INSTALLATIONS</b></p> <p><b>5-1.</b> Determine actions or changes since previous review of noise management (GMP).</p> <p style="text-align: center;">...</p> <p><b>5-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p><b>5-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <p style="padding-left: 40px;">- <i>Noise Control Regulation.</i></p> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning noise management have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p>
<p><b>VEHICLE NOISE</b></p> <p><b>5-4.</b> Noise levels of motorized land vehicles are subject to specific limits (Noise Control Regulation, Section 2, Article 7, para 2).</p> <p style="text-align: center;">...</p> <p><b>5-5.</b> The use of horns or other sound-producing devices on motor vehicles is restricted (Noise Control Regulation, Section 2, Article 7, para 3).</p> <p style="text-align: center;">...</p>	<p>Verify that the noise produced by motor vehicles operated on the installation do not exceed the levels given in Table 5-1. (1)</p> <p style="text-align: center;">...</p> <p>Verify that the use of sound-producing devices on vehicles, except for warning, is prohibited on the installation. (1)</p> <p>Verify that warning horns of motor vehicles operated on the installation have a noise level of 105-118 dBA at a distance of 2 m from, and at a height of 1.20 m above the vehicle and within a frequency spectrum of 1800-3550 Hz.</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>5-6.</b> Motorized land vehicles are required to be equipped with mufflers (Noise Control Regulation, Section 2, Article 7, para 1).</p> <p style="text-align: center;">...</p>	<p>Verify that vehicles operated on the installation are required to be equipped with mufflers. (1)</p> <p>Verify that removing mufflers or rendering them inoperable, except for maintenance, repair, or other purposes of modification, is prohibited on the installation.</p> <p style="text-align: center;">...</p>
<p><b>RESIDENTIAL NOISE</b></p> <p><b>5-7.</b> Noise levels in residential areas are required to meet specific limits (Noise Control Regulation, Section 3, Article 12).</p> <p style="text-align: center;">...</p>	<p>Verify that traffic noise in residential areas on the installation does not exceed 35-45 dBA, as modified by the revisions given in Table 5-2. (1)(3)</p> <p>Verify that noise from sources other than traffic does not exceed the levels given in Table 5-3.</p> <p>Verify that sound pressure levels in the interiors of buildings do not exceed the limits given in Table 5-4.</p> <p>Verify that designs for architectural projects on the installation take into account the interior noise limits given in Table 5-5</p> <p style="text-align: center;">...</p>
<p><b>5-8.</b> The use of noise-producing tools and machinery in residential or noise-sensitive areas is subject to specific regulations (Noise Control Regulation, Section 4, Article 15).</p> <p style="text-align: center;">...</p>	<p>Verify that the tools and machinery specified in Table 5-6 are not used from 20:00 to 8:00 hours on weekdays, or on weekends, except as permitted by the municipality. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>CONSTRUCTION CONCERNS</b></p> <p><b>5-9.</b> The noise levels of industrial, roadbuilding, and construction machinery are subject to specific limits (Noise Control Regulation, Section 2, Article 6, para 1).</p> <p style="text-align: center;">...</p>	<p>Verify that noise from machinery operated on the installation does not exceed the limits given in Table 5-6. (1)(3)</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>5-10.</b> Noise levels at construction sites are subject to specific limits (Noise Control Regulation, Section 2, Article 6, para 2).</p> <p style="text-align: center;">...</p>	<p>Verify that the noise levels at construction sites on the installation do not exceed the limits given in Table 5-3. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>5-11.</b> The use of sound insulation in buildings is required (Noise Control Regulation, Section 3, Article 13, para 10).</p> <p style="text-align: center;">...</p>	<p>Verify that plans for new buildings or major repair of old buildings on the installation provide for sound insulation in: (1)(3)</p> <ul style="list-style-type: none"> <li>- structural elements</li> <li>- interior and exterior wall coverings</li> <li>- ceilings</li> <li>- roofs.</li> </ul> <p style="text-align: center;">...</p>
<p><b>5-12.</b> Noise levels must be taken into consideration in the choice of construction methods (Noise Control Regulation, Section 3, Article 13, para 11).</p> <p style="text-align: center;">...</p>	<p>Verify that construction methods used on the installation comply with the maximum permissible noise levels given in Table 5-3, taking into account the existing noise levels 100 m from the exterior walls and the estimates of future noise levels and types of spaces involved. (1)(3)</p> <p>Verify that the following characteristics of the building's surface are taken into account in the choice of construction methods:</p> <ul style="list-style-type: none"> <li>- smoothness and porosity</li> <li>- whether it is in layers or solid</li> <li>- the space between the layers</li> <li>- how the layers of insulation material are connected to each other and to the other structural elements</li> <li>- the number of such connections</li> <li>- the total area of the windows</li> <li>- the placement of windows in the wall</li> <li>- the thickness and type of glass</li> <li>- details of the woodwork and wall connections</li> <li>- total area of the structural elements</li> </ul> <p>(NOTE: Turkish Standards Institute standards are used to determine the sound transmission losses of structural elements such as building, wall and ceiling coverings, depending on the type of construction materials used.)</p> <p style="text-align: center;">...</p>
<p><b>5-13.</b> Turkish municipalities may request acoustical reports in order to control indoor or outdoor environmental noise (Noise Control Regulation, Section 3, Article 13, para 13).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation is prepared to provide acoustical reports if requested. (1)(3)</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>5-14.</b> The control of noise is required during the construction and repair of roads and highways passing through residential areas and during demolition of buildings (Noise Control Regulation, Section 4, Article 16).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation takes measures to control road construction and building demolition noise, including the restriction of the use of noisy machinery. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>BUILDING NOISE</b></p> <p><b>5-15.</b> The sound insulation of noise-producing equipment in attached buildings is subject to specific regulations (Noise Control Regulation, Section 3, Article 13, para 14).</p> <p style="text-align: center;">...</p>	<p>Verify that the sound insulation of noise-producing equipment in attached buildings conforms with standards published by the Turkish Standards Institute. (1)(3)</p> <p>(NOTE: This protocol applies to types of equipment that transmit noise by means of floors, ceilings and common walls. Examples are:</p> <ul style="list-style-type: none"> <li>- elevators</li> <li>- household appliances</li> <li>- garbage chutes</li> <li>- plumbing</li> <li>- radios</li> <li>- televisions.)</li> </ul> <p style="text-align: center;">...</p>
<p><b>5-16.</b> Noise produced in existing buildings must be prevented from being transmitted throughout the building (Noise Control Regulation, Section 3, Article 13, para 15).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation takes measures to prevent the transmission within buildings of noise arising from the use of buildings or spaces for non-designated purposes. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>5-17.</b> Owners of industrial buildings and workplaces are required to take measures against the propagation of noise within their facilities (Noise Control Regulation, Section 4, Article 14).</p> <p style="text-align: center;">...</p>	<p>Verify that machinery and other equipment inside and outside industrial buildings on the installation is properly positioned for noise control. (1)(3)</p> <p>Verify that openings in the buildings' exterior walls are properly located for noise control.</p> <p>Verify that the installation reports these measures to local Turkish authorities.</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>MISCELLANEOUS NOISE</b></p> <p><b>5-18.</b> Sound levels of electronically amplified music in public places and residential areas are subject to specific limits (Noise Control Regulation, Section 4, Articles 17 and 18).</p> <p style="text-align: center;">...</p> <p><b>5-19.</b> Advertising by shouting or using loudspeakers is subject to specific regulations (Noise Control Regulation, Section 4, Article 19).</p> <p style="text-align: center;">...</p> <p><b>5-20.</b> The playing of noise-producing equipment must meet specific conditions (Noise Control Regulation, Section 4, Article 20).</p> <p style="text-align: center;">...</p> <p><b>5-21.</b> The playing of musical instruments must meet specific conditions (Noise Control Regulation, Section 4, Article 21).</p> <p style="text-align: center;">...</p> <p><b>5-22.</b> The operation of motorboats is subject to specific requirements (Noise Control Regulation, Section 4, Article 23).</p> <p style="text-align: center;">...</p>	<p>Verify that the levels of electronically amplified music on the installation do not exceed 90 dBA, or 5 dBA more than the existing background noise. (1)(3)</p> <p>(NOTE: This limit does not apply to enclosed places of entertainment if a sign is posted at the entrance stating, "Attention! The noise level inside may cause permanent hearing loss.")</p> <p style="text-align: center;">...</p> <p>Verify that the installation prohibits advertising by shouting or loudspeakers in residential and commercial areas, except in the areas and during the times permitted by local Turkish authorities. (1)(3)</p> <p style="text-align: center;">...</p> <p>Verify that the installation prohibits the playing of radios, televisions, stereos and similar equipment in residential or noise-sensitive areas under the following conditions: (1)(3)</p> <ul style="list-style-type: none"> <li>- between 00:00 hours and 07:00 hours</li> <li>- in vessels on public waters</li> <li>- in other public places in such a way as to cause noise discomfort at a distance of 15 m</li> <li>- in such a way as to cause discomfort on public transport vehicles.</li> </ul> <p style="text-align: center;">...</p> <p>Verify that the installation prohibits the playing of musical instruments in such a way as to cause noise discomfort on public transport vehicles or at a distance of 15 m. (1)(3)</p> <p style="text-align: center;">...</p> <p>Verify that the installation prohibits the operation within 15 m of the shoreline of motorboats that produce a noise level in excess of 80 dBA (Leq) on the boat or 70 dBA on the shore. (1)(3)</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**COMPLIANCE CATEGORY:  
ENVIRONMENTAL NOISE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>5-23.</b> The operation of model vehicles is subject to specific noise restrictions (Noise Control Regulation, Section 4, Article 24).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation prohibits the operation of motor-driven models that cause noise discomfort, such as model ships or airplanes, in residential areas, noise-sensitive zones or public places between 20:00 and 08:00 hours. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>5-24.</b> The operation of mechanically-driven equipment such as sewing machines, drills, saws, grinders and lawnmowers is subject to specific noise limitations (Noise Control Regulation, Section 4, Article 25).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation prohibits the operation of noisy equipment between 20:00 and 08:00 hours. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>5-25.</b> The use of fireworks is subject to specific noise regulations (Noise Control Regulation, Section 4, Article 26).</p> <p style="text-align: center;">...</p>	<p>Verify that the use of fireworks causing noise discomfort in public places, roads, or residential areas is prohibited on the installation. (1)(3)</p> <p>(NOTE: The Turkish government may license fireworks displays.)</p> <p style="text-align: center;">...</p>
<p><b>5-26.</b> The use of emergency signals is subject to specific noise regulations (Noise Control Regulation, Section 4, Article 27).</p> <p style="text-align: center;">...</p>	<p>Verify that the use of fire alarms, burglar alarms, civil defense warnings, sirens, whistles, and similar emergency signals, except in the case of necessity or emergency, is prohibited on the installation. (1)(3)</p> <p>Verify that emergency warning systems are tested no more than once per month, at the same time of day, between 10:00 hours and 20:00 hours.</p> <p style="text-align: center;">...</p>
<p><b>5-27.</b> Domestic animals are subject to specific noise regulations (Noise Control Regulation, Section 4, Article 28). (1)(3)</p> <p style="text-align: center;">...</p>	<p>Verify that the installation prohibits the keeping in residential areas or noise-sensitive zones of animals that cause noise discomfort.</p> <p style="text-align: center;">...</p>

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

**Table 5-1**

**Maximum Noise Levels for Motor Vehicles**  
(Noise Control Regulation, Table 1)

Type of vehicle	Maximum noise level (dBA)
Automobile	75
Bus (in city)	85
Bus (outside city)	80
Heavy vehicles (in driver's cabin) and Trucks (at 80 km/h)	85
Locomotive interiors (Diesel-engine, operating at full power and load at 80 km/h with windows closed)	85
Electrical train locomotives	80
Railroad car interiors	70





**Table 5-2****Modifications to Basic Criterion for Traffic Noise**  
(Noise Control Regulation, Table 3)

<b>Zone Definition</b>		<b>Basic Criterion (Leq: 35-45 dBA)</b>
<b>Zone I</b>	Residential area outside city (far from traffic)	0
<b>Zone II</b>	Dwellings at city's edge	+5
	Urban residential area (100 m from traffic flow)	+10
	Urban residential area, main roads, workplaces	
	60 m from traffic flow	+15
<b>Zone III</b>	City-center residential area, main roads, workplaces (20 m from traffic flow)	+20
<b>Zone IV</b>	Industrial zone or main roads where heavy vehicles and buses pass	+25
<b>Time of Day</b>		
	Daytime (06:00-19:00)	0
	Evening (19:00-22:00)	-5
	Night (22:00-06:00)	-10

(NOTE: The basic criterion for noise-sensitive areas and future planning is 35 dBA.)



**Table 5-3**

**Limits for Noise Sources Other than Traffic**  
(Noise Control Regulation, Table 4)

Source of Noise		Leq (dBA)	
		Daytime (06:00-22:00)	Night (22:00-0:600)
Railroad noise		65	55
Industrial noise	Continuous	65	55
	Sudden	70	60
Construction site noise	Building construction (continuous)	70	-
	Road construction (temporary)	75	-
	Impact noise	100 (L <sub>max</sub> )	-
Airports			
	(or equivalent WECPNL values)	70	60



**Table 5-4****Acceptable Indoor Space Pressure Levels**  
(Noise Control Regulation, Table 5)

Area of use		Acceptable sound pressure level
Rest and recreational areas	Theaters	25
	Conference halls	30
	Hotel rooms	30
	Hotel restaurants	35
Medical institutions	Hospitals	35
Residences	Bedrooms (city)	35
	Living rooms (outside city)	40
	Living rooms (edge of city)	45
	Living rooms (city)	60
Educational institutions	Schools, laboratories	45
	Gymnasiums, cafeterias	60
Commercial buildings	Private offices	50
	General offices (clerical and accounting departments, shops)	60
Industrial buildings	Factories (large)	70
	Factories (small)	80



**Table 5-5**

**Noise-sensitive Areas of Activity and Noise Source Areas**  
 (Noise Control Regulation, Table 6)

<b>Type of building</b>	<b>Noise-sensitive area of activity</b>	<b>Noise source area of activity</b>
<b>Residences</b>	Bedrooms, living rooms, dining rooms, studies, music rooms, examining rooms in doctors' homes, balconies and yards stairs, home workshops, music practice rooms, playgrounds, sports grounds	Circulation, heating and plumbing areas, carparks, garages, laundry rooms, elevators, water pumps,
<b>Schools</b>	Classrooms, reading rooms lecture halls, administrative offices, infirmaries and maintenance rooms, laboratories, sleeping spaces in nursery schools	Yards and playgrounds gymnasiums, workshops, music studios, kitchens, heating and plumbing areas, carparks
<b>Hospitals</b>	Patients' rooms, waiting areas, operating rooms, intensive care units, rest areas, corridors and administrative offices	Heating and plumbing plants, elevators, kitchen and service areas, carparks
<b>Administrative</b>	Special work areas	Noisy work areas, computer centers, heating and plumbing plants, circulation areas, cafeterias, kitchen and other service areas, garages and carparks
<b>Commercial</b>	Special offices, sales areas, childcare centers display areas and restaurants	Noisy sales areas, play areas, cafeterias, kitchen and other service areas, garages and carparks
<b>Type of building</b>	<b>Noise-sensitive area of activity</b>	<b>Noise source area of activity</b>
<b>Hotels</b>	Bedrooms, lobbies, dining rooms, conference halls, administrative spaces, observation decks, courtyards and gardens	Heating and plumbing plants, kitchen and service areas, carparks and garages, open-air restaurants, discotheques, dance halls, and other noisy entertainment and sports areas





**Table 5-6****Maximum Noise Levels for Industrial, Road Building and Construction Machinery**  
(Noise Control Regulation, Annex 1)

<b>NOISE SOURCES</b>	<b>Noise Level (Leq dBA)</b>
Trucks (at 7.5 m)	85
Passenger vehicles (at 7.5 m)	85
Motorcycles (at 7.5 m)	80
Locomotives (at 30 m)	90
Diesel-powered scrapers and bulldozers (100-450 kw)	120
Diesel-powered shovels with caterpillar treads (40-60 kw)	110
Diesel-powered excavators (45-80 kw)	105
Pneumatic concrete curshers (36 kg)	110
Diesel-powered cranes with caterpillar treads	105
Diesel-powered dump trucks (1.2-2.5 tons)	100
Diesel-powered vibrating cylinders (2-75 kw)	110
Cement mixers	115
Cement pumps	115
Graders	120
Rock-drilling guns	125
Compressors (stationary)	115
Tractors	120
Loaders	115
Gears	95

**Table 5-6 (continued)**

<b>NOISE SOURCES</b>	<b>Noise Level (Leq dBA)</b>
Electric motors (300 hp, 1200 rev/sec)	105
Pumps (300 hp, >1600 rev/sec)	120
Fans (axial and radial, 1 m <sup>3</sup> /s 4cm H <sub>2</sub> O)	85
Fans (canal profile, 1 m <sup>3</sup> /s 4cm H <sub>2</sub> O)	70
Automatic lathes	85
Arc welders	85
Punch presses	95
Pneumatic drills	95
Wood planing machines	95
Lathe benches	95
Steel plate honers	95
Pig iron or steel slitters	95
Routers	95
Rivet pitching machines	95
Groove cutting machines	95
Wood polishing machines	95
Automatic gear cutting machines	95
Steel plate cutters	95
Electrical flat welders	95
Pipe welding machines	95
Electric, gas or oil furnaces	105
Impact hammers	105
Pneumatic hammers	105

**Table 5-6 (continued)**

<b>NOISE SOURCES</b>	<b>Noise Level (Leq dBA)</b>
Steel wire hooping machines	105
Compressors	105
Air presses	105
Pneumatic riveting guns	105
Riveting hammers	105
Circular saws for cutting metal or wood	105
Pneumatic wrenches	105
Air chisels for casting	115
Internal combustion saws	115
Nailing machines	115
Textile looms	95

(NOTE: Average values are given for noise levels. This list shall be expanded by communiques to be issued by the Prime Ministry General Directorate of Environment. Noise levels shall be determined in accordance with the methods recommended in the standards of the Turkish Standards Institute.)



<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>ENVIRONMENTAL NOISE MANAGEMENT</b> Turkey	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Base Civil Engineering (Environmental/Community Planning)) (2) Deputy for Operations (Air Space Manager) (3) Public Affairs Office

## **Section 6**

### **Pesticide Management**

## Section 6

### PESTICIDE MANAGEMENT

#### A. Applicability

Since it can be expected that pesticides will be used as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *Water Pollution Control Regulation.* This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution. Included are requirements to prevent the contamination of water sources by pesticides.
- *Communique on Dangerous and Hazardous Substances in Water.* This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water.

#### C. State Laws and Regulations

- None available at this time.

#### D. Key Compliance Definitions

- *Dangerous and Harmful Waste* - this can include processed by-products, processed waste, non-reactive raw material, used apparatus and installation devices for manufacturing industries, industrial activities and products along with consumer waste, and chemical used in agricultural activities such as pesticides, herbicides, fungicides and insecticides. This also include wastes that are made of dangerous and harmful materials because of the type, amount, and concentration, chemical efficacy, physical condition, mobility, durability, and other similar reasons of the constituents in their contents (Communique on Dangerous and Hazardous Substances, Article 5).

- **Dangerous and Hazardous Substances** - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic effects or which are resistant to biological treatment processes, and which, in order not to cause pollution of ground and surface waters, require special treatment or elimination in accordance with the Communiqués to be based on this regulation (Water Pollution Control Regulation, Article 2).



**PESTICIDE MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: (*)
All installations	6-1 through 6-4	(1)(2)
Storage	6-5 and 6-6	(1)(4)(5)
Spill prevention	6-7	(1)(4)(5)
Waste pesticides	6-8	(1)(2)(4)(5)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Base Civil Engineering)
- (2) BEE (Bioenvironmental Engineering)
- (4) Pest Management Shop
- (5) Golf Course Maintenance



## **PESTICIDE MANAGEMENT**

### **Records to Review**

- Records of pesticides purchased by the facility (purchase orders, inventory)
- Pesticide application records
- Description of the facility's pest control program
- Certificates of applicators of restricted-use pesticides
- Facility applicator certification and training program
- Pesticide disposal manifests

### **Physical Features to Inspect**

- Pesticide application equipment
- Pesticide storage areas, including storage containers
- Golf course maintenance areas

### **Sources to Interview**

- BCE (Base Civil Engineering)
- BEE (Bioenvironmental Engineering)
- BMS (Base Medical Service)/EHO (Environmental Health Office)
- Pest Management Shop
- Golf Course Maintenance
- Base Fire Department
- Base Contracting Officer



COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<b>ALL INSTALLATIONS</b>	
6-1. Determine actions or changes since previous review of pesticides management (GMP).  ...	Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)  ...
6-2. Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).  ...	Verify that copies of the following regulations are maintained and kept current at the installation: (1)  - <i>Water Pollution Control Regulation</i>  ...
6-3. Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)  ...	Determine if any new regulations concerning pesticides management have been issued since the finalization of the manual. (1)  Verify that the installation is in compliance with newly issued regulations. (1)  ...
6-4. Water Pesticides used on the installation must be approved by the Ministry of Agriculture, Forestry, and Rural Affairs (Pollution Control Regulation, Section 4, Article 22, Section K).  ...	Verify that pesticides employed on the installation are approved by the Ministry of Agriculture, Forestry, and Rural Affairs.  ...

(1) BCE (Base Civil Engineering) (2) BEE (Bioenvironmental Engineering) (4) Pest Management Shop (5) Golf Course Maintenance

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>STORAGE</b></p> <p>6-5. Pesticides that may become dissolved in wastewater or rainwater and then conveyed to groundwater must not be directly stored on the ground within a groundwater feeding basin (Water Pollution Control Regulation, Section 4, Article 22, para G)</p> <p>...</p> <p>6-6. All storage tanks for chemical substances of all kinds, including pesticides, must be constructed in such a way to prevent seepage from contaminating the groundwater (Water Pollution Control Regulation, Section 4, Article 22, para I).</p> <p>...</p> <p><b>SPILL PREVENTION</b></p> <p>6-7. In order to prevent pollution of groundwater during an accident involving the use of dangerous and hazardous substances, including pesticides, spill cleanup materials are required to be available (Water Pollution Control Regulation, Section 4, Article 22, para N).</p> <p>...</p>	<p>Verify that pesticides that may be come dissolved in wastewater or rainwater are not directly stored on the ground within a groundwater feeding basin. (1)(4)(5)</p> <p>...</p> <p>Verify that tanks are constructed to prevent seepage. (1)(4)(5)</p> <p>...</p> <p>Verify that spill cleanup materials are available at storage and use sites. (1)(4)(5)</p> <p>...</p>

(1) BCE (Base Civil Engineering) (2) BEE (Bioenvironmental Engineering) (4) Pest Management Shop (5) Golf Course Maintenance

**COMPLIANCE CATEGORY:  
PESTICIDE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>WASTE PESTICIDES</b></p> <p><b>6-8.</b> Wastes of pesticides as listed in Tables 6-1 and 6-2 must be stored as required by the <i>Communique on Dangerous and Hazardous Substances</i> (Water Pollution Control Regulation, Section 4, Article 22, para H and the <i>Communique on Dangerous and Hazardous Substances</i>, Article 6).</p> <p align="center">...</p>	<p>Determine if the installation uses any of the pesticides listed in Tables 6-1 and 6-2. (1)(2)(4)(5)</p> <p>Verify that the waste products of these pesticides are stored correctly.</p> <p align="center">...</p>

(1) BCE (Base Civil Engineering) (2) BEE (Bioenvironmental Engineering) (4) Pest Management Shop (5) Golf Course Maintenance





Table 6-1

**Dangerous and Harmful Substances Classified as STS 3**  
(Communique on Dangerous and Harmful Substances, Annex 1, Table 5)

Index #	Substance Name	Water Solu-bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac-terias	Acute Toxcty Fish	Danger # Water	Expintns.
9	Acryolin	265000	5	6.7	5.6	5.8	
14	Allilamin	&	5	3.2	4.2	4.1	
20	Anilin	34000	3	3.9	4.2	3.7	F
21	Anisol	hs	5		3.9		C
1	Acetalydhyde	&	3		3.9		C,F
5	Acetateacid methylesther	350000					F
8	Acetonitril	&	1	3.2	2.2	2.1	
24	Atrazene	70	1		4.5		C
141	Copperdisulfate	s	3	7.5	6.1	5.5	
33	Benzelchloride	hs	3	5.3	5.5	4.6	
31	Benzonitril	hs	5	5.0	4.0	4.7	
34	Beryliumnitrate	s	1	7.7	4	4.2	A
76	1,2 diethylbenz	200	3		4.5		C
74	2,4 dichlorbenz	150	3	4.8	4.5	4.1	
75	2,3 dichlorphenl	4,500	3	5.2	5.3	4.5	C
82	2,4 dimethylanln	hs	3	5.1	3.7	3.9	E
73	Di-n-butilate	s			4.2		C
84	1,3 dinitrobenz	650	5	4.9	5	5	
85	Dinirbutolphenol	50	5		5.7		C,F
103	Ethyl diamine	&	3	6.1	3.4	4.2	
109	2-ethyl hexsilam	s	3	4.1	4.8	4.0	
102	ethyline chlorid	8650	3	3.9	3.5	3.5	
171	Phenylacetate	1000	3	3.9	4.9	3.9	E
170	Phenol	82000	3	4.2	4.6	3.9	E
173	Phtalicaciddiaslt	hs	3	4	6.4	4.5	
112	Formaldehyde	s	3	4.9	4.0	4.0	
	35% by volume soluble						
119	Fuel Oil(163/345)	5	1				C
113	Furfurol	83000	5	4.8	4.5	4.8	
115	Gasoil(172/323)	5	1				C
117	Glycacid butol est	46000					F
123	Hexachlorbutane	hs	3				E
128	Hydroquinone	72000	3	4.2	6.8	4.7	
134	Isooctanol	s		4.2	4.6		C
50	Karbaril	<1000	3		4.7		C,F
189	Carb tetra chloride	770	1	4.5	4.0	3.2	
139	Kerosene (158/246)	10	1				C

Table 6-1 (continued)

Index #	Substance Name	Water Solu-bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac-terias	Acute Toxcty Fish	Danger # Water	Exptltns.
51	Chlorhydrate	&	3	5.8	2.8	3.9	E
53	Chlorbenzene	490	1	4.8	7.7	4.2	
157	Chlor phen metox methyolate	580	1	5	4.1	3.4	
54	Choloroform	8200	1	3.9	3.8	2.9	B
55	2-Chlortoluene	hs	1	4.8	4.1	3.3	
140	m-Cresole	31000	3	4.3	4.7	4.0	
206	Xylene	200	3		4.1		C,F
59	Kumol Hydrperox	hs	3		4.9		C
35	Lead 2-acetate	s	1	5.7	3.2	3.3	D,F
183	Carbon Sulfate(CS <sub>2</sub> )	2200	3		4.0		C
76	Diesel(161/334)	5	1				C
147	Methyl acrylate	60000	5	4.3	5.1	4.8	
145	Methy acetate	292000					F
149	Metylene chloride	20000	1	3.3	3.3	2.5	
155	Mineral turpentine	20	1				C
156	Monoflor acetic acid		7	4.2	3.6	4.9	
159	Nickel chlorate	550000	5	8.5	3.2	5.6	B
132	Nitrilisobutirate	ls	5		3.6		C
162	4-Nitroaniline	600	3	5.4	4.5	4.3	
163	Nitrobenzene	1900	3	5.2	4.2	4.1	
164	2-Nitrotoluene	a 40	3	4.7	4.5	4.1	
27	Petrolether(40/71)	50	1				C
28	petrolether(61/135)	40	1				C
175	Picratacid (50% soluble)	&	5	3.0	3.5	3.8	E
179	Pridine	&	3	3.5	3.6	3.4	F
177	2-Propinol-1	1	5	3.8	5.7	4.8	
181	Salycilaldehyde	1700	3	5.0	5.4	4.5	
67	Cyclohexilamine	s	5	3.4	3.7	4.0	
56	Sodiumdichromate	s	3	6.1	3.7	4.3	A
161	Sodiumnitrate	s	7	3.9	3.5	4.8	
184	Sodiumselenite	a s	7	4.7	4.0	5.2	
188	Sodiumsulfur	180000	7	5.8	4.6	5.8	
186	Naphta solvent (186/210)		15	1			C
187	Styrene	320	1	4.1	4.8	3.3	F
192	Thallium 1-nitrate	96000	5		3.7		C
194	Toluene	470	1	4.5	4.2	3.2	F
195	O-Toludine	15000	3	4.8	3.9	3.9	B,E
198	1,1,1-Trichlorethane	1300	1	4.0	3.9	3.0	
199	Trichlorethylene	1000	1	4.2	3.9	3.0	B
203	Vinyl acetate	20000	1	5.2	4.6	3.6	F
204	VKNormal	160	1		4.4		C
205	VKSuper	380	1		5.7		C

**Table 6-2**

**Very Dangerous and Harmful Substances for Water Receptor Mediums  
(WDC 4)**

Index #	Sub- stance Name	Water Solu- bility	Acute Oral Toxicity Mammals	Acute Toxicity # Bacteria	Acute Toxicity # Fish	Danger # H <sub>2</sub> O	Exptltns.
10	Acrylonitril	s	5		4.6		A.C
7	Acetone Cyanhydr		7		5.8		C
29	Benzine	1	1800	4.0	4.5	3.2	A
180	Merc(2)chloride	s	5	8	6.3	6.4	
70	p-p' - DDT	0.0012	5				C.D
23	Disodhyrgarsnt	s	5	4.7	4.0	3.9	A
92	Epi Chlorhidrin	hs	5	4.3	4.6	4.6	A
167	Ethyl Paration	24	7		6.3		C.F
108	Ethyl Imino	&	7	5.3	5.7	6.0	A
185	Silver Nitrate	2.1mln	5	8.2	6.4	6.5	
130	Hydrg. hydroxst		7	7.7	6.1	6.9	A
49	Cadm. Nitrate	s	3	7.1	4.2	4.8	
35	Lead Tetra Eth	300					
143	Linden	10	5		6.6		C
144	Merkaptan						F
60	Sodmcynate	s	7	9	7.2	7.7	



<b>INSTALLATION:</b> 	<b>COMPLIANCE CATEGORY:</b> <b>PESTICIDE MANAGEMENT</b> <b>Turkey</b>	<b>DATE:</b> 	<b>REVIEWER(S):</b> 
<b>STATUS</b> <b>NA   C   RMA</b>	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Base Civil Engineering) (2) BEE (Bioenvironmental Engineering) (4) Pest Management Shop (5) Golf Course Maintenance

## **Section 7**

### **Petroleum, Oil and Lubricant (POL) Management**

## Section 7

### POL MANAGEMENT

#### A. Applicability

Since it can be expected that petroleum, oils and lubricants (POL) will be used as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *Water Pollution Control Regulation.* This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution. In particular, it addresses preventing the pollution of water by petroleum, oils, and lubricants.
- *Communique on Dangerous and Hazardous Substances in Water.* This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water. In Annex 2 of this document, used and residual oils, hydrocarbons, and their emissions mixed with water are classified as "dangerous and harmful wastes". Therefore the storage and disposal of these waste products is addressed in *Hazardous Waste Management*.

#### C. State Laws and Regulations

- None available at this time

#### D. Key Compliance Definitions

- None available at this time





**POL MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	<b>REFER TO WORKSHEET ITEMS:</b>	<b>CONTACT THESE PERSONS OR GROUPS: (*)</b>
All installations	7-1 through 7-5	(1)(2)(3)(4)(9)(10)(11)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BEC (Base Environmental Coordinator)
- (2) BCE (Base Civil Engineer)
- (3) BFMO (Base Fuels Management Office)
- (4) LFM (Liquid Fuels Maintenance)
- (9) AAFES (Army/Air Force Exchange Station) Service Station Manager
- (10) Generating Activities
- (11) Vehicle Maintenance Shop



## **POL MANAGEMENT**

### **Records to Review**

- Records of all spills, leaks, and associated site assessment/cleanup activities (for 3 years)
- Spill Prevention and Response Plan
- Records of spill response training

### **Physical Features to Inspect**

- Refueling facilities, including:
  - aboveground storage tanks and dikes
  - venting
  - fill pipe
  - gauges
- Washrack areas
- Vehicle maintenance areas
- Oil separators
- Oil and hazardous substance site

### **Sources to Interview**

- BEC (Base Environmental Coordinator)
- BCE (Base Civil Engineer)
- BFMO (Base Fuels Management Office)
- LFM (Liquid Fuels Maintenance)
- BEE (Base Bioenvironmental Engineer)
- Base Fire Department
- Power Production
- AAFES (Army/Air Force Exchange Station) Service Station Manager
- Generating Activities
- Vehicle Maintenance Shop



COMPLIANCE CATEGORY: POL MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<b>ALL INSTALLATIONS</b>	
<p><b>7-1.</b> Determine actions or changes since previous review of POL management (GMP).</p> <p>...</p> <p><b>7-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p>...</p> <p><b>7-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p>...</p> <p><b>7-4.</b> The importation, production and marketing of solid, liquid, and gaseous fuels is subject to specific requirements (Air Quality Protection Regulation, Article 45).</p> <p>...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p>...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <p>- <i>Water Pollution Control Regulation</i></p> <p>...</p> <p>Determine if any new regulations concerning POL management have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p>...</p> <p>Verify that fuels imported into Turkey are in compliance with specifications issued by the Ministry of Energy and Natural Resources. (1)(2)(4)</p> <p>Verify that if the installation imports fuels, it submits to Turkish customs a document certified by the producing firm stating the properties of the fuel.</p> <p>Verify that a report is made to the local representative of the central administration in the province concerning the amount and properties of imported fuel marketed on the installation.</p> <p>Verify that drivers of vehicles that transport solid, liquid or gaseous fuels on intercity highways carry in their vehicle the certified document from the producer stating the place of origin of the fuel they are transporting, and are prepared to present it upon request.</p> <p>...</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (5) AAFES (Army/Air Force Exchange Station) Service Station Manager (10) Generating Activities (11) Vehicle Maintenance Shop

COMPLIANCE CATEGORY: POL MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p>7-5. The discharge of petroleum products into water is prohibited (Water Pollution Control Regulation, Article 24).</p> <p>...</p>	<p>Verify that no discharges of oil and petroleum wastes, bilge waters and ballast waters are made into water media from motorized vessels based on the installation. (3)(4)(9)(10)(11)</p> <p>Verify that the installation has on hand at all times the organization, equipment and materials required for combating possible oil spills into water media as a result of accidents or other special conditions.</p> <p>Verify that plans for combating oil spills do not include the use of chemical precipitants to precipitate oil dispersed in a water medium, or the use of chemical dispersants to dilute it, except under conditions when there is a risk of fire.</p> <p>...</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (9) AAFES (Army/Air Force Exchange Station, Service Station Manager) (10) Generating Activities (11) Vehicle Maintenance Shop

<b>INSTALLATION</b>	<b>COMPLIANCE CATEGORY:</b> POL Management Turkey	<b>DATE</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BFMO (Base Fuels Management Office) (4) LFM (Liquid Fuels Maintenance) (9) AAFES (Army/Air Force Exchange Station) Service Station Manager (10) Generating Activities (11) Vehicle Maintenance Shop

## **Section 8**

### **Solid Waste Management**



## Section 8

### SOLID WASTE MANAGEMENT

#### A. Applicability

Since it can be expected that solid waste will be produced as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *Solid Waste Control Regulation.* The purpose of this regulation, effective 3 April 1991, is to address issues involving solid wastes that cause damage to the environment. In particular, those solid wastes placed directly or indirectly at waste storage sites, subsequent transportation and disposal. Also included are wastes disposed from residential communities, public parks, and those wastes of a vegetative nature that result from pruning and landscaping, including large wastes. This regulation does not apply to non-hazardous wastes from private and official foundations. This regulation does not address residue leaving substances in the air, land and water that are inflammable and that cause infectious microbes.
- *Water Pollution Control Regulation.* This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution. This includes preventing stored garbage and sludge from reaching water sources.
- *Communique on Dangerous and Hazardous Substances in Water.* This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water. It also identifies a list of wastes that are considered to not be dangerous or harmful, see Table 8-1.

The **Regulation Concerning the Application of Coastal Law** (published as number 20594 in the *Resmî Gazete* on 3 August 1990) establishes the shoreline of the ocean, of natural and artificial lakes, and of rivers. It also contains provisions relevant to the disposal of solid waste.

### C. State Laws and Regulations

- None available at this time.

### D. Key Compliance Definitions

- *Businesses subject to quota or deposit* - businesses which import plastic or metal containers filled with the products listed in ANNEX-1, and businesses which fill those containers with those products.
- *Compost* - soil-like materials produced by combustion of organic solid waste with oxygen.
- *Construction Debris* - wastes from building sites or the waste from excavations and accompanying sludges. These are considered non-hazardous (Solid Waste Control Regulation, Article 1).
- *Disposal* - includes the following processes:
  - temporary accumulation of solid wastes discarded at residential or business areas
  - collection and transportation of solid wastes
  - incinerating solid wastes in order to obtain new materials and energy
  - systematic recycling and storage of solid wastes in order to make them non-hazardous to human health and the environment, and for economic benefit.
- *Dried Material* - the amount of residual solid remaining after solid waste or compost has been dried to a constant weight in a dryer oven at 103 °C for approximately 24 hours (h).
- *Germ-free Sludge* - mud from which epidemic germs have been destroyed by the process of chemical stabilization, composting, heating and thermal drying, and chemical and thermal cleaning.
- *Hazardous and Dangerous Waste* - wastes, either from residential communities or industrial and commercial bodies, which are determined by the Undersecretariat to be any of the following:
  - explosive materials
  - inflammable or spontaneously inflammable materials
  - materials that emit inflammable gases in reaction with water
  - oxidizing materials
  - materials containing organic peroxide

- toxic or corrosive materials
  - materials that emit toxic gases in reaction with water or air
  - ecotoxic materials (Solid Waste Control Regulation, Section 1, Articles 2 and 3).
- *Large Waste* - those materials that are no longer useful, have a substantially large volume and are used in homes, such as refrigerators, washing machines, and furniture.
  - *Law* - Environmental Law No. 2872.
  - *Organic Materials or Combustion Loss* - the amount of burnt or lost materials when the solid wastes and composts, after being dried, are burnt in the ash oven at 775 °C.
  - *Producer* - any establishment or person whose activities produce waste.
  - *Quota* - the ratio of the amount of recycled containers to the refilled containers, for the purpose of disposal and recycling of those plastic and metal containers which are worn out over time by refilling.
  - *Recycling of Materials* - the process of deriving making economic benefit from recyclable materials in the solid wastes, such as plastic and glass, without applying any chemical or biological reaction.
  - *Residential Solid Waste (garbage)* - articles discarded from houses, parks, and picnic areas, that do not have a hazardous or poisonous waste status.
  - *Shore* - the area between the shoreline and shore margin line (Regulation Concerning the Application of Coastal Law, Article 4).
  - *Shoreline* - the natural line where the water meets the land; it changes in accordance with meteorological phenomena, but overflowing of oceans, natural and artificial lakes, and rivers are not included (Regulation Concerning the Application of Coastal Law, Article 4).
  - *Shore Margin Line* - after having passed from the shorelines of marine, natural and artificial lakes, and rivers, the natural borders are those in the direction of the land where the water movements meet with formations of sand, gravel, rocky areas, marshy areas, swamps and the like (Regulation Concerning the Application of Coastal Law, Article 4).

- ***Solid Waste*** - Articles that should be discarded by the producer, for the benefit of society through protection of the environment. Sludges and solid wastes for disposal are those materials which may destroy the social satisfaction and environmental well being. In this regulation solid waste refers to residential waste and large solid waste.
- ***Treated Sludge*** - dried mud that was obtained from the physical, chemical and biological processing of residential wastewater or industrial wastewater of a residential nature by removing moisture.
- ***Treatment Installations*** - includes the following types of installations:
  - recycling installations
  - compost and incineration installations that convert solid wastes into energy or make them usable
  - others installations and buildings where the volume and polluting qualities of solid wastes are reduced.
- ***Undersecretariat*** - the Environmental Undersecretariat of the Prime Ministry.
- ***Untreated Sludge*** - purified mud that has not passed through the process of decomposition, drying and removing water.

**SOLID WASTE MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	<b>REFER TO WORKSHEET ITEMS:</b>	<b>CONTACT THESE PERSONS OR GROUPS: (*)</b>
All installations	8-1 through 8-3	(1)(2)
Recycling	8-4	(1)
Storage and collection	8-5 through 8-17	(2)(3)
Compost	8-18	(3)
Incinerators	8-19 through 8-21	(2)(3)
Disposal	8-22 through 8-24	(2)(3)
Special wastes	8-25 and 8-26	(2)(3)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BEC (Base Environmental Coordinator)
- (2) BCE (Base Civil Engineer)
- (3) BEE (Bioenvironmental Engineering)



## **SOLID WASTE MANAGEMENT**

### **Records to Review**

- Record of current nonhazardous solid waste management practices
- Documentation of locations (map) and descriptions of all nonhazardous waste treatment, storage, and disposal facilities (TSDFs)
- Records of operational history of all active and inactive TSDFs
- Environmental monitoring procedures or plans
- Records of resource recovery practices, including the sale of materials for the purpose of recycling
- Solid waste removal contracts and inspection records

### **Physical Features to Inspect**

- Resource recovery facilities
- Incineration and land disposal facilities (active and inactive)
- Areas where hazardous and nonhazardous wastes are disposed of
- Construction debris areas
- Waste receptacles
- Solid waste vehicle storage and washing areas

### **Sources to Interview**

- BEC (Base Environmental Coordinator)
- BCE (Base Civil Engineer)
- BEE (Bioenvironmental Engineering)





COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<b>ALL INSTALLATIONS</b>	
<b>8-1.</b> Determine actions or changes since previous review of solid waste (GMP).  ...	Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)  ...
<b>8-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).  ...	Verify that copies of the following regulations are maintained and kept current at the installation: (1)  <ul style="list-style-type: none"> <li>- <i>Solid Waste Control Regulation</i></li> <li>- <i>Water Pollution Control Regulation</i></li> </ul> ...
<b>8-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)  ...	Determine if any new regulations concerning solid waste have been issued since the finalization of the manual. (1)  Verify that the installation is in compliance with newly issued regulations. (1)  ...
<b>RECYCLING</b>	
<b>8-4.</b> As a producer of solids waste, installation are required to participate in available recycling, waste reduction programs (Solid Waste Control Regulation, Section 2, Article 4; Section 5, Article 22).  ...	Verify that the installation is aware of and prepared to participate in programs sponsored by the Turkish government in the following areas: (1)  <ul style="list-style-type: none"> <li>- evaluation and recycling of solid waste</li> <li>- avoidance of harmful materials in solid waste</li> <li>- reduction of the production of solid waste</li> <li>- choice of technologies that produce the least solid waste.</li> </ul> (NOTE: This includes residential and residential-industrial solid waste.  ...

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<b>STORAGE AND COLLECTION</b>	
<p><b>8-5.</b> The containers in which solid waste is collected are subject to specific requirements (Solid Waste Control Regulation, Section 4, Articles 18 and 19).</p> <p>...</p> <p><b>8-6.</b> All storage tanks for garbage and process and treatment sludge must be constructed in such a way to prevent seepage from contaminating the groundwater (Water Pollution Control Regulation, Section 4, Article 22, para I).</p> <p>...</p> <p><b>8-7.</b> Vehicles used for the transportation of solid waste are subject to specific regulations (Solid Waste Control Regulation, Section 4, Article 20).</p> <p>...</p> <p><b>8-8.</b> Specific wastes are prohibited from being stored with residential solid waste (Solid Waste Control Regulation, Section 5, Article 22).</p> <p>...</p>	<p>Verify that the size, shape and construction material of containers for the collection of residential and industrial solid waste are in compliance with specifications issued by the Undersecretariat. (2)(3)</p> <p>Verify that dumpsters used for the collection of non-residential waste</p> <ul style="list-style-type: none"> <li>- are in the proper shape and volume for the protection of human and environmental health and appearance</li> <li>- do not give off bad smells or leave residues of waste</li> <li>- are covered in such a way as to prevent harm to the environment.</li> </ul> <p>...</p> <p>Verify that tanks are constructed to prevent seepage. (2)(3)</p> <p>...</p> <p>Verify that solid waste is transported in vehicles that are covered to protect the environment from contamination and offensive odors. (2)(3)</p> <p>...</p> <p>Verify that the following wastes are not stored with residential solid waste: (2)(3)</p> <ul style="list-style-type: none"> <li>- liquids and liquid wastes</li> <li>- untreated sludge</li> <li>- explosive materials</li> <li>- medical wastes</li> <li>- animal carcasses</li> <li>- wastes that may cause dust, noise, pollution or odor</li> <li>- radioactive wastes</li> <li>- solid hazardous wastes.</li> </ul> <p>...</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)

**COMPLIANCE CATEGORY:  
SOLID WASTE MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>8-9.</b> Facilities for storage of solid wastes are subject to specific requirements (Solid Waste Control Regulation, Section 5, Article 24).</p> <p style="text-align: center;">...</p>	<p>Verify that solid waste storage facilities for residential and industrial-type solid waste and treated sludge are not constructed: (2)(3)</p> <ul style="list-style-type: none"> <li>- in areas where drinking water is obtained, in which dumping or storage of solid waste is prohibited by the municipality</li> <li>- less than 1,000 m from the nearest residential area, unless permitted by the Undersecretariat</li> <li>- in areas where there water is obtained for drinking, household uses, or irrigation, when there is a risk of landslide, overflow, avalanche or erosion.</li> </ul> <p style="text-align: center;">...</p>
<p><b>8-10.</b> The planning of solid waste storage facilities is subject to specific requirements (Solid Waste Control Regulation, Section 5, Article 25).</p> <p style="text-align: center;">...</p>	<p>Verify that solid waste storage facilities are planned to serve 10 years' anticipated need. (2)(3)</p> <p>Verify that the roads providing access to the storage facility and its internal roads are constructed for use in all weather conditions.</p> <p>Verify that the facility is surrounded by a fence.</p> <p>Verify that the facility is equipped to clean the wheels of vehicles in order to protect outside streets from pollution.</p> <p>Verify that the facility has a weigh station with a capacity of 35 metric tons and a platform measuring 3 x 18m.</p> <p style="text-align: center;">...</p>
<p><b>8-11.</b> Storage floors of solid waste storage facilities are subject to specific regulations (Solid Waste Control Regulation, Section 5, Article 26).</p>	<p>Verify that the storage floor is at least 1 m from the natural groundwater level. (2)(3)</p> <p>Verify that the storage floor is impermeable.</p> <p>Verify that the coefficient of permeability of the compacted bottom depth is at least <math>1 \times 10^{-8} \text{ m/s}</math>, taken as <math>1 \times 10^{-7} \text{ m/s}</math> in the bottom depth that has the least amount of cracked rock with 10 m of depth.</p> <p>Verify that leakage water is collected at one point through drainage pipes on the waterproof floor.</p> <p>Verify that drainage pipes have a diameter of 100 mm and an inclination of 1 percent.</p> <p>Verify that drainage pipes discharge separately and directly from the site area with no curvature or turns, either vertical or horizontal.</p> <p>Verify that control chimneys are installed at the storage facility release points.</p> <p>Verify that sand and gravel filters are set up around the drainage pipes, with a minimum height of 30 cm from the back of the pipe.</p> <p>Verify that the collected leakage water is treated to comply with the water pollution control regulations.</p>

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**COMPLIANCE CATEGORY:  
SOLID WASTE MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>8-12.</b> Gases produced by solid waste storage facilities are subject to specific regulations (Solid Waste Control Regulation, Section 5, Article 27).</p> <p style="text-align: center;">...</p>	<p>Verify that storage facilities are equipped with horizontal and vertical gas collection systems to recycle or discharge to the atmosphere the following gases: (2)(3)</p> <ul style="list-style-type: none"> <li>- methane gas</li> <li>- carbon dioxide</li> <li>- hydrogen sulfate</li> <li>- ammonia</li> <li>- nitrogen compounds.</li> </ul> <p style="text-align: center;">...</p>
<p><b>8-13.</b> The storage of treated sludge with residential solid waste is subject to specific regulations (Solid Waste Control Regulation, Section 5, Article 28).</p> <p style="text-align: center;">...</p>	<p>Verify that treated sludge stored in solid waste storage facilities is no more than 65 percent water. (2)(3)</p> <p>(NOTE: This ration may be raised to 75 percent by the managers of the storage facilities, provided that this will not cause offensive odors or excess water in the facility.)</p> <p style="text-align: center;">...</p>
<p><b>8-14.</b> Solid waste storage facilities are required to prevent negative effects on the environment (Solid Waste Control Regulation, Section 5, Article 29).</p> <p style="text-align: center;">...</p>	<p>Verify that storage facilities take precautions to prevent: (2)(3)</p> <ul style="list-style-type: none"> <li>- dust emissions</li> <li>- offensive odors</li> <li>- release of paper</li> <li>- excessive noise</li> <li>- feeding by domestic or wild animals</li> <li>- breeding of crawling or flying insects.</li> </ul> <p style="text-align: center;">...</p>
<p><b>8-15.</b> Reforestation of solid waste storage sites is required (Solid Waste Control Regulation, Section 5, Article 30).</p> <p style="text-align: center;">...</p>	<p>Verify that the top and ramp of storage sites are laid out with agricultural soil of a thickness appropriate to the plants' root depth. (2)(3)</p> <p>Verify that the highest level of soil is on a slope of more than 3 percent in order to promote runoff of precipitation.</p> <p style="text-align: center;">...</p>
<p><b>8-16.</b> Storage facilities for residential or residential-type industrial solid wastes and treated sludge are required to be licensed (Solid Waste Control Regulation, Section 5, Article 31).</p> <p style="text-align: center;">...</p>	<p>Verify that any such storage facility operated by the installation has a license issued by the Metropolitan Municipalities or their sub-districts, or, if located outside a Metropolitan Municipalities, the local representative of the central government. (2)(3)</p> <p style="text-align: center;">...</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)

**COMPLIANCE CATEGORY:  
SOLID WASTE MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>8-17.</b> Solid waste storage facilities are required to have an individual in charge (Solid Waste Control Regulation, Section 5, Article 32).</p> <p style="text-align: center;">...</p>	<p>Verify that for any such facility the installation has appointed a person with responsibility for: (2)(3)</p> <ul style="list-style-type: none"> <li>- inspecting solid waste brought to the storage site</li> <li>- rejecting non-residential type industrial wastes</li> <li>- managing and building the storage site</li> <li>- providing information to the Undersecretariat.</li> </ul> <p style="text-align: center;">...</p>
<p style="text-align: center;">...</p> <p><b>COMPOST</b></p>	<p style="text-align: center;">...</p>
<p><b>8-18.</b> When it is done, the collection of compost is subject to specific requirements (Solid Waste Control Regulation, Section 6, Article 33).</p> <p style="text-align: center;">...</p>	<p>Verify that composting of kitchen and garden wastes is done in facilities erected for this purpose. (3)</p> <p>Verify that organic waste for composting is collected separately from other solid wastes.</p> <p style="text-align: center;">...</p>
<p style="text-align: center;">...</p> <p><b>INCINERATORS</b></p>	<p style="text-align: center;">...</p>
<p><b>8-19.</b> The design of incinerators for solid waste is subject to specific requirements (Solid Waste Control Regulation, Section 7, Article 38).</p> <p style="text-align: center;">...</p>	<p>Verify that a front silo is installed. (2)(3)</p> <p>Verify that a vacuum system is used to prevent the emission of dust during unloading.</p> <p>Verify that absorbed air is sent to the incineration chamber for burning.</p> <p>Verify that in the event of malfunction of the incineration chamber, the absorbed air is emitted from the chimney to the environment.</p> <p>Verify that liquid wastes and treated sludge are kept covered in the storage area.</p> <p>Verify that the incinerator is equipped with a spare incinerator chamber which can function instantly.</p> <p>Verify that the incinerator is in compliance with air quality regulations, including chimney gas emission limits.</p> <p>Verify that a final incineration chamber is available.</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
SOLID WASTE MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>8-20.</b> The operation of incinerators for solid waste is subject to specific requirements (Solid Waste Control Regulation, Section 7, Article 38).</p> <p style="text-align: center;">...</p>	<p>Verify that the excess of oxygen gas in the chimney gases of solid waste incinerators is: (2)(3)</p> <ul style="list-style-type: none"> <li>- 17 percent if the capacity of the incinerator is less than 0.75 ton/hr</li> <li>- 11 percent if the capacity is greater than 0.75 ton/hr.</li> </ul> <p>Verify that the heat of the incineration chamber is no less than 800 °C, or 1200 °C if a significant amount of polychlorine aromatics and hydrocarbons are incinerated.</p> <p>Verify that after the final burning, the released slag or sediment is no more than 2 percent the amount of unburned wastes by weight, or 3 percent if the waste is treated sludge.</p> <p>Verify that slag/sediment and chimney gas particles are collected separately.</p> <p>Verify that measures are taken to evaluate the outcome of the incinerated medium output of heat and slag/sediment.</p> <p>Verify that a chimney gas cleaning system is used to comply with the emission limits given in the Air Quality Protection Regulation.</p> <p>Verify that incineration is not used for dangerous wastes containing:</p> <ul style="list-style-type: none"> <li>- more than 1 percent chlorine as a proportion of organic wastes</li> <li>- more than 50 g halogen/kg of organic wastes.</li> </ul> <p style="text-align: center;">...</p>
<p><b>8-21.</b> Incinerator facilities constructed for the purpose of burning residential solid waste, residential treated sludge and residential solid waste of industrial type are not allowed to incinerate specific types of dangerous waste (Solid Waste Control Regulation, Section 7, Article 40).</p> <p style="text-align: center;">...</p>	<p>Verify that dangerous wastes composed of more than 1 percent chlorine for the rest of the organic waste or that is made up of more than 50 grams of halogen per kilo of organic waste are not burned. (2)(3)</p> <p style="text-align: center;">...</p>
<p><b>DISPOSAL</b></p> <p><b>8-22.</b> The disposal of excavated soil is subject to specific restrictions (Solid Waste Control Regulation, Section 5, Article 23).</p> <p style="text-align: center;">...</p>	<p>Verify that excavated soil is disposed of in the place authorized by the municipality, and not into any body of water. (2)(3)</p> <p style="text-align: center;">...</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>8-23.</b> Disposal of solid waste on the installation is required to take specific measures into account (Solid Waste Control Regulation, Section 2, Article 5).</p> <p>...</p> <p><b>8-24.</b> The place of disposal of solid waste is subject to specific restrictions (Solid Waste Control Regulation, Section 4, Article 18).</p> <p>...</p> <p><b>SPECIAL WASTES</b></p> <p><b>8-25.</b> Certain classes of solid waste must be disposed of separately (Solid Waste Control Regulation, Section 2, Article 8).</p> <p>...</p> <p><b>8-26.</b> Waste may not be deposited on shores (Regulation Concerning the Application of Coastal Law, Article 5).</p>	<p>Verify that the installation's solid waste disposal activities take into account the reduction of harm to: (2)(3)</p> <ul style="list-style-type: none"> <li>- human mental and physical health</li> <li>- animal health</li> <li>- natural plant cover</li> <li>- green areas</li> <li>- buildings</li> <li>- security</li> <li>- social harmony</li> <li>- underground, surface and reservoir water quality</li> <li>- air quality</li> <li>- environmental noise.</li> </ul> <p>...</p> <p>Verify that the installation does not dispose of solid waste in any of the following locations: (2)(3)</p> <ul style="list-style-type: none"> <li>- the sea</li> <li>- lakes and similar media</li> <li>- streets</li> <li>- forests</li> <li>- places where the environment is negatively affected.</li> </ul> <p>...</p> <p>Verify that the installation does not dispose of the following with residential waste: (2)(3)</p> <ul style="list-style-type: none"> <li>- waste of hospitals, clinics and laboratories that may carry disease or radiation</li> <li>- batteries that may be harmful to health</li> <li>- pharmaceutical wastes that may be harmful to health.</li> </ul> <p>Verify that the installation cooperates with local Turkish authorities in the preparation and separate disposal of such wastes.</p> <p>...</p> <p>Verify that no wastes (including soil, garbage, and ashes) are deposited on shores. (2)(3)</p>

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)





**Table 8-1**

**Characteristics of General Waste**  
(Communique on Dangerous and Harmful Substances, Annex 3)

1. Wastes formed from residential areas
2. Wastes formed from office and commercial areas
3. Wastes formed during the restoration, service, erection, and destruction of the buildings and installations
4. Wastes emitted from cleaners and laundromats
5. Waste from excavation
6. Wastes from road building and restoration
7. Wastes formed from installations involving shearing, molding, and grinding with drying processes
8. Wastes formed during the processes of treatment and softening of water to be used in the processes of drinking, household use, preparation of foodstuffs, cooling and industrial enterprises
9. Wastes formed from the treatment of sewage system water characteristic of residential areas
10. Wastes formed from the production and cultivation of livestock
11. Wastes formed from breweries and the other processes of fermentation
12. Wastes containing one or more than one substance of dry or moist paper, cellulose, wood oil paper, bachelized paper, plastic, clay, porcelain, glass, ceramic, mica, iron, steel, aluminium, brass, copper, tin, zinc, coal, coke coal, carbon, graphite, ash
13. Wastes formed from the manufacturing of iron, steel, copper, tin or mixture of them
14. Wastes containing natural or synthetic caulchouc, sands, silica, boiler sediment, electrical devices, iron oxides, iron hydroxides
15. Wastes containing one or more than one substances of cement, concrete, calcium carbonate, calcium sulfate, calcium chloride, magnesium carbonate, magnesium oxide, zinc oxide, aluminium oxide, titanium oxide, copper oxide, sodium chloride; wastes containing cork, ebonite, diatomite, bran, wollen, cotton, flax and other natural fibres, leather, artificial fibres, cord, rope, chaff, stearate
16. Wastes formed during the production, process, and distribution of foods, and whole foods
17. Cosmetic material wastes
18. Death of flora and fauna or their remains, materials from excavations (in the condition of being natural), and solid phase substances are not soluble in water and any acids

**Table 8-1 (continued)**

19. In the condition of artificial jips! and sulfite compounds waste; those wastes are emitted from the installations where reductions of chimney gas sulfur and other industrial activities are carried out

<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>SOLID WASTE MANAGEMENT</b> Turkey	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) BEC (Base Environmental Coordinator) (2) BCE (Base Civil Engineer) (3) BEE (Bioenvironmental Engineering)

**Section 9**

**Special Programs Management**

## **Section 9**

### **SPECIAL PROGRAMS MANAGEMENT**

#### **A. Applicability**

Since it can be expected that asbestos and PCB wastes will be produced as a regular part of the activities that take place on any Air Force installation, this section of the manual applies to all installations.

#### **B. National Laws and Regulations**

- *Communique on Dangerous and Hazardous Substances in Water.* This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water. Within this document the following are classified as "dangerous and harmful" waste and therefore the disposal of these items is discussed in *Hazardous Waste Management*:

- wastes and pieces containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCT), and/or polybrominated biphenyls (PBB);
- wastes containing friable asbestos.

#### **C. State Laws and Regulations**

- None available at this time.

#### **D. Key Compliance Definitions**

- None available at this time.



## **SPECIAL PROGRAMS MANAGEMENT**

### **GUIDANCE FOR CHECKLIST USERS**

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	<b>REFER TO WORKSHEET ITEMS:</b>	<b>CONTACT THESE PERSONS OR GROUPS: (*)</b>
All installations	9-1 through 9-3	(1)(2)
PCBs	9-4	(2)(3)(4)

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#### **(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Environmental Planning)
- (2) BEE (Bioenvironmental Engineering)
- (3) BCE (Exterior Electric Shop)
- (4) DRMO (Defense Reutilization and Marketing Office)





## **SPECIAL PROGRAMS MANAGEMENT**

### **Records to Review**

- Inspection, storage, maintenance, and disposal records for PCBs/PCB Items
- PCB Equipment inventory and sampling results
- Asbestos management plan
- Documentation of asbestos sampling and analytical results
- Documentation of preventive measure or action
- Results of air sampling at the conclusion of response action
- Records of asbestos training program
- List of buildings insulated with asbestos or housing ACMs
- Record of demolition or renovation projects completed in the past 5 years (yr) that involve friable asbestos

### **Physical Features to Inspect**

- PCB storage areas
- Equipment, fluids, and other items, used or stored at the facility, that contain PCBs
- Pipe, spray-on, duct, and troweled cementitious insulation, and boiler lagging
- Ceiling and floor pipes

### **Sources to Interview**

- BCE (Environmental Planning)
- BEE (Bioenvironmental Engineering)
- BCE (Exterior Electric Shop)
- DRMO (Defense Reutilization and Marketing Office)
- BCE (Contract Programmer)
- BCE (Contract Management)
- BCE (Chief of Operations and Maintenance)
- School Principal
- Asbestos Program Officer
- Asbestos Operating Officer



**COMPLIANCE CATEGORY:  
SPECIAL PROGRAMS MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>ALL INSTALLATIONS</b></p> <p><b>9-1.</b> Determine actions or changes since previous review of PCBs, asbestos, and radon (GMP).</p> <p style="text-align: center;">...</p> <p><b>9-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p><b>9-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p> <p><b>PCBs</b></p> <p><b>9-4.</b> The incineration of PCB-containing wastes is subject to specific requirements (Air Quality Protection Regulation, Annex 7, Section 2.1.2).</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning PCBs, asbestos, and radon have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p> <p>Verify that wastes containing polychlorobiphenyls are incinerated at plants that are suitable for such substances. (2)(3)(4)</p> <p style="text-align: center;">...</p>

(1) BCE (Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) BCE (Exterior Electric Shop) (4) DRMO (Defense Reutilization and Marketing Office)



<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>SPECIAL PROGRAMS MANAGEMENT</b> Turkey	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> NA    C    RMA	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) BCE (Exterior Electric Shop) (4) DRMO (Defense Reutilization and Marketing Office)

**Section 10**

**Water Quality Management**

## Section 10

### WATER QUALITY MANAGEMENT

#### A. Applicability

Since it can be expected that wastewater will be produced as a regular part of the activities that take place on any Air Force installation and drinking water consumed, this section of the manual applies to all installations.

#### B. National Laws and Regulations

- *Water Pollution Control Regulation*. This regulation was published in the *Official Gazette* number 19919 on 9 April 1988. The purpose of the regulation is to outline the legal and technical foundation for defining the principles of water pollution control in order to protect Turkey's surface and groundwater for uses of all kinds, to ensure the optimum use, and to prevent water pollution.

The primary pollutant effects from which water is required to be protected are the following:

- fecal wastes
  - organic wastes
  - discharges in excess of standards of nutrient substances which cause excessive increases in productivity
  - wastewater
  - radioactive wastes
  - increased turbidity, shallowness and alteration of coastline caused by mud and garbage, excavation wastes and other types of wastes
  - substances other than those above for which limits are prescribed in the *Dangerous and Hazardous Substances Communique* (Water Pollution Control Regulation, Section 2, Article 6).
- *Communique on Dangerous and Hazardous Substances in Water*. This communique was published in the *Official Gazette* on 12 March 1989. The purpose of the communique is to revise and list substances, including wastes, which are harmful and dangerous in order to protect surface and ground water.
  - *The Law Concerning Groundwaters* (Law No. 167 of 16 December 1960) permits the establishment of Groundwater Management Areas in which specific provisions related to the drilling of wells and their operation apply.

- The *Water Products Law* (Law No. 1380 of 22 March 1971) addresses issues related to the protection, manufacturing, and management of water products; in that context it also forbids the disposal of hazardous materials in waters for any reason whatsoever.

### C. State Laws and Regulations

- None available at this time.

### D. Key Compliance Definitions

- *Absolute Protection Zone* - a 300-meter (m) wide strip extending from the maximum water level of a drinking and bathing water reservoir. If the boundary of such a zone exceeds the boundary of the water collection basin, the absolute protection zone ends at the basic boundary (Water Pollution Control Regulation, Section 4, Article 17).
- *Administration* - the Administrations referred to in the regulations include:
  - the Prime Ministry General Directorate of the Environment, which is empowered by Article 12 of Environment Law No. 2872 (amended by Law No. 3416 of 3 March 1988) to supervise the purification, disposal, importation and treatment of wastes, residues and fuels to render them harmless
  - the following agencies, which are empowered to issue operating and use permits to companies, corporations and enterprises and to conduct inspections:
    - the Ministry of Health and Social Security under articles 268-275 of Public Health Law No. 1593
    - the Ministry of Culture and Tourism under Law No. 2634 for the Promotion of Tourism
    - the Ministry of Industry and Trade and other institutions and agencies under Law No. 3143 concerning the Establishment and Functions of the Ministry of Industry and Trade
    - local representatives of the central government and metropolitan and municipal mayors' offices in line with the powers vested in them by Law No. 5442 on Provincial Administration, Law No. 3030 on the Administration of Metropolitan Municipalities, and Municipality Law No. 1580 and all other provisions regarding this subject in other special laws
  - wastewater infrastructure plant managements which issue connection permits and connection quality control permits in areas where such managements are located



- for permission to discharge wastewater into water reception media, the Metropolitan Municipal Mayors Offices within the boundaries of Metropolitan municipalities and the local representative of the central government outside municipal boundaries, in line with the views of and the decisions taken by the local environmental boards
  - for deep-sea discharges, the Metropolitan Municipal Mayors Offices inside municipal boundaries and the local representative of the central government outside municipal boundaries, on the condition of soliciting the opinion of the General Directorate of the Bank of the Provinces and the consent of the General Directorate of Environment
  - in the use and protection of groundwaters, the General Directorate of the State Department of Water, which has authority in this area in accordance with Groundwater Law No. 167 and Law No. 6200 concerning the Establishment and Functions of the State Department of Water
  - in the case of suspension of the activities mentioned in Articles 15 and 16 of Environmental Law No. 2872, the Ministry of Health and Social Security, the Prime Ministry General Directorate of the Environment and the local representatives of the central government
  - to impose penalties of an administrative nature as specified in Articles 20, 21, 22 and 23 of the aforementioned law, amended by Law No. 3301, the public agencies and corporations empowered by Article 24 of Environment Law No. 2872, amended by Law No. 3301
  - the relevant Provincial Governors' Offices and the relevant Regional Directorates of the State Department of Water when a need is felt for the development of an environment management plan within a "basin" covering more than one administrative area (Water Pollution Control Regulation, Article 2).
- *Advanced Purification Techniques of Proven Economic Feasibility* - technological methods, devices, modes of operation and treatment methods, whose success has been proved by experience in continuous operation, which can be checked by means of comparable methods, devices and modes of operation, which render practical and usable the measures taken to maintain discharge limits into receptor media and wastewater infrastructure facilities, and which can be implemented under future and country conditions (Water Pollution Control Regulation, Article 2).
  - *Amount of Wastewater Produced* - the amount of wastewater produced in a given period as determined either by measurements or by calculations based on water consumption for a specific period (Water Pollution Control Regulation, Article 2).
  - *Basin* - the whole of the region in which the groundwater and surface waters that feed a water resource such as a river, lake, dam reservoir or groundwater reservoir collect (Water Pollution Control Regulation, Article 2).

- ***Bays and Gulfs*** - parts of the sea whose exchange of water with the open sea is obstructed by a strait or wider channel, or which are formed by the irregular nature of the coastline (Water Pollution Control Regulation, Article 2).
- ***Belt Canal*** - a wastewater canal constructed for the purpose of protecting dams, lakes and bays where wastewater from the environment is collected along the length of the shore (Water Pollution Control Regulation, Article 2).
- ***Characteristic Water Quality*** - the 90th percentile of the values found in measurements of any parameter in water samples collected to determine the quality of a receptor medium (Water Pollution Control Regulation, Article 2).
- ***Classification of Dangerous and Harmful Substances for Water Medium.*** - grouping based on the substances dangerous level. There are four water dangers categories, the Turkish abbreviation is STS:
  - STS4 is very dangerous and harmful for water medium
  - STS3 is dangerous and harmful for water medium
  - STS2 is less dangerous and harmful for water medium
  - STS1 is non-dangerous and non-harmful for water medium.
- ***Coastal Protection Zone*** - bodies of water along sea coasts and lake shores which require protection from the risk of pollution when used as beaches or for other similar purposes (Water Pollution Control Regulation, Article 2).
- ***Coastline*** - the line formed by the contact between land and water, apart from flood conditions, in seas, natural or manmade lakes, dam reservoirs and rivers (Water Pollution Control Regulation, Article 2).
- ***Composite Sample*** - a mixed sample collected at specific time intervals from household and industrial wastewaters in proportion to wastewater flow (Water Pollution Control Regulation, Article 2).
- ***Dam Reservoir*** - a structure built on a river for the purpose of impounding water or controlling flood water; a dam reservoir is the space created for this purpose at the dam source (Water Pollution Control Regulation, Article 2).
- ***Dangerous and Hazardous Substances*** - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic effects or which are resistant to biological treatment processes, and which, in order not to cause pollution of ground and surface waters, require special treatment or elimination in accordance with the Communiques to be based on this regulation (Water Pollution Control Regulation, Article 2).

- ***Dangerous and Harmful Substances in Water*** - substances which cause acute or chronic toxicity through absorption by the respiratory or digestive systems or through the skin, which have carcinogenic or teratogenic effects or which are resistant to biological treatment processes, and which cause pollution of ground and surface waters without special treatment or elimination, and which cause danger to the environment (Communique on Dangerous and Hazardous Materials in Water, Article 2).
- ***Diffuser*** - in deep-sea discharges, a special device added to the end of a wastewater pipe for the purpose of diluting the cloud of wastewater introduced into the receptor medium, of ensuring that the primary dilution (S1) value reaches the envisaged levels of 40 - 100 or higher by using a multi-jet stream, and of regulating the flow properties of the wastewater during its exit into the receptor medium (Water Pollution Control Regulation, Article 2).
- ***Dilution*** - reduction of the concentration of a pollutant parameter contained in a wastewater discharge as a result of physical or hydrodynamic phenomena occurring in the receptor medium due to the discharge itself or to various physical, chemical and biochemical reactions (Water Pollution Control Regulation, Article 2).

(NOTE: the quantity of this reduction can be calculated on the basis of the method of discharge into, and the properties of, the receptor medium.)

- ***Discharge*** - the systematic disposal of wastewater, treated or untreated, directly or indirectly into a receptor medium or under the ground, excluding seepage of returning irrigation waters from coasts or into the soil using appropriate engineering structures (Water Pollution Control Regulation, Article 2).
- ***Drinking and Bathing Water*** - the water used by human beings in their daily activities for needs such as drinking, washing and bathing, which is available for the common use of a large number of consumers through a mass water supply system and which must possess the properties stated in TS 266 (Water Pollution Control Regulation, Article 2).
- ***Drinking and Bathing Water Reservoir*** - a natural lake or dam reservoir created for this purpose, from which water for drinking and other purposes is supplied (Water Pollution Control Regulation, Article 2).
- ***Environmental Protection Areas*** - special areas allocated for the purposes of protecting, and passing on undamaged to future generations, the ecological balance in some special regions of the country known for their natural richness, designated in accordance with Environmental Law No. 2872 of 3 March 1988 and Article 9 of Law No. 3416 (Water Pollution Control Regulation, Article 2).

- ***Fecal Wastes*** - urine, feces and other excreta of human beings and other mammals which give rise especially to bacteriological pollution of a body of water (Water Pollution Control Regulation, Article 2).
- ***Fish Bioassay*** - a standard test designed to determine the toxic effect of wastewater on the fish species used as indicator organisms, and which makes it possible to determine toxicity dilution rates by specifying the percentages of fish that remain alive at the end of certain periods, such as 48, 72, or 96 hours (h), in various dilutions of wastewater (Water Pollution Control Regulation, Article 2).
- ***Flow*** - the volume of water passing through a flow cross-section in a given unit of time (Water Pollution Control Regulation, Article 2).
- ***Freshwater Parting*** - the boundary line at which the salinity of inland water resources with a connection to the sea increases perceptibly and where the concentration of chlorine ions is assumed to be 250 milligrams per liter (mg/L) (Water Pollution Control Regulation, Article 2).
- ***Groundwater*** - the water that occupies water-filled crevices under the earth's surface (Water Pollution Control Regulation, Article 2).
- ***Groundwater Management Areas*** - areas proposed by the General Directorate for State Waterworks (DSI) that are approved and announced by the relevant Ministry and in which specific provisions relating to water use and management apply (Law Concerning Groundwaters, Articles 3 and 4).
- ***House Connection (Lateral)*** - the length of pipe, belonging to the property owner, which conveys wastewaters from the wastewater source to the sewerage system and which extends from the sewer ventilation pipe on the property to the wastewater canal (Water Pollution Control Regulation, Article 2).
- ***House Sewage Ventilation Column*** - a column, the specifications of which have been stipulated by the Bank of the Provinces, for collecting samples, making measurements, and monitoring wastewater flow at the house connection with the canal (Water Pollution Control Regulation, Article 2).
- ***House Wastewater Drainage Plant*** - a system providing for the collection, pre-treatment, regulation and connection of wastewater with the city sewerage system (Water Pollution Control Regulation, Article 2).
- ***Household Wastewater*** - wastewater originating from needs and uses in the normal daily life activities of human beings and issuing from residences, schools, hospitals and small enterprises such as hotels (Water Pollution Control Regulation, Article 2).

- **Industrial Wastewater** - process and wash waters of all kinds originating from industrial installations, manufacturing plants, workshops, repair shops, small industrial sites and organized industrial zones, as well as boiler and cooling waters, which are treated and disposed of without mixing with process waters (Water Pollution Control Regulation, Article 2).
- **Industrial Zone** - organized industrial zones engaged in specific areas of production; regions where various small and large-scale industrial enterprises are found collectively, including small businesses and artisans' workshops, small industrial zones and other enterprises with the status of legal entities engaged in production as cooperatives, and where wastewater is collected and disposed of in a common system (Water Pollution Control Regulation, Article 2).
- **Inland Water Resource** - all natural and manmade surface and groundwaters on land and, in the case of water resources with a connection to the sea, waters up to the freshwater-saltwater divide (Water Pollution Control Regulation, Article 2).
- **Mediate Protection Zone** - a 1-kilometer (km) wide strip extending from the boundary of the proximate protection zone surrounding water level of a drinking and bathing water reservoir. If the boundary of such a zone exceeds the boundary of the water collection basin, the mediate protection zone ends at the basic boundary (Water Pollution Control Regulation, Article 19).
- **Organic Waste** - organic substances which give rise to oxygen consumption by undergoing biochemical breakdown in the water medium with which they mix (Water Pollution Control Regulation, Article 2).
- **Pre-treatment Plant** - water treatment plants of all kinds for:
  - ensuring purification of the wastewater collected in a sewerage system up to the limits acceptable in that system, or
  - ensuring the acceptability of wastewater for a wastewater treatment or disposal plant either attached to an organized industrial zone or publicly operated for the purpose of complying with the limit values envisaged for water entering such enterprises, or
  - treatment of wastewaters prior to their direct disposal into a receptor medium by means of deepsea discharges (Water Pollution Control Regulation, Article 2).

- ***Productivity*** - the levels of productivity of sea and lake waters which result from their properties and influence their form of use. Gross primary productivity is the amount of inorganic carbon in water masses such as seas and lakes that is converted into organic products per unit of time and surface area and absorbed by an organism; net primary productivity is the amount of primary productivity remaining after deducting internal respiration and other energy losses (Water Pollution Control Regulation, Article 2).
- ***Proximate Protection Zone*** - a 700-m wide strip extending from the absolute protection zone surrounding a drinking and bathing water reservoir. If the boundary of the zone exceeds the boundary of the water collection basin, the proximate protection zone ends at the basin boundary (Water Pollution Control Regulation, Article 18).
- ***Rainwater Source*** - canals carrying rainwater, surface waters and drainage waters in separate sewer systems (Water Pollution Control Regulation, Article 2).
- ***Receptor Medium and Classes Thereof*** - the immediate and greater environment, such as lakes, rivers, coastal and sea waters and groundwater, into which wastewater is either discharged or becomes indirectly mixed (Water Pollution Control Regulation, Article 2).
- ***Receptor Medium Sampling Point*** - the point where samples are collected after wastewater has become thoroughly mixed with the receptor medium following discharge into it (Water Pollution Control Regulation, Article 2).
- ***Remote Protection Zone*** - the whole of the water collection basin that falls outside the other protection zones surrounding a drinking and bathing water reservoir (Water Pollution Control Regulation, Article 20).
- ***Reservoir*** - a volume of water created by impounding (Water Pollution Control Regulation, Article 2).
- ***Sampling Point*** - the point where wastewater is collected and discharged into the city wastewater system or another receptor medium (Water Pollution Control Regulation, Article 2).
- ***Sewerage System*** - a network of canals or connected pipes for either separately collecting, removing or conveying to a treatment plant household and/or industrial wastewaters and rainwater, or, in an integrated system, for collecting all wastewater together (Water Pollution Control Regulation, Article 2).

- **Stratification** - the existence of more than one mass of water with different properties in estuaries, gulfs, bays or lakes, or in segments of coastal or open sea waters due to sudden fluctuations in temperature, salinity and, as a result of these, density (Water Pollution Control Regulation, Article 2).
- **$T_{90}$ -Value** - the length of time required for initial concentrations of fecal-source indicator microorganisms to fall to 10 percent under stable hydrodynamic and dispersive dilution conditions in marine and coastal environments (Water Pollution Control Regulation, Article 2).
- **Thorough Mixing Point** - the point nearest to the discharge point where the wastewater dispersed into a receptor medium reaches a uniform concentration (Water Pollution Control Regulation, Article 2).
- **Toxicity** - the endangering of the balance of the ecosystem and the health of human beings and various indicator organisms when a substance defined as toxic is found above a certain concentration in a water medium; a property that gives rise to acute or chronic illnesses, to teratogenic and genetic damage, or to death (Water Pollution Control Regulation, Article 2).
- **Toxicity Dilution Factor (TDF)** - a unit used to indicate the degree of toxicity of wastewaters (Water Pollution Control Regulation, Article 2).
- **Waste** - waste energy and materials in solid, liquid or gaseous state, resulting from production and consumption activities of all kinds, which may give rise either directly or indirectly to changes in the natural composition and properties of the receptor media with which they mix due to their physical, chemical and bacteriological characteristics, and which affect the potential use of the medium (Water Pollution Control Regulation, Article 2).
- **Wastewater** - water which is polluted as a result of industrial, agricultural or other uses or whose properties have been partially or completely altered; waters originating from mines and mineral ore processing plants, and waters arising from surface or sub- surface runoff caused by rain from paved or unpaved streets, parking lots and similar parts of built-up urban environments (Water Pollution Control Regulation, Article 2).
- **Wastewater Collection Basin** - the total number of areas where wastewaters are collected before being introduced into receptor media, within the limits specified in the pertinent engineering studies (Water Pollution Control Regulation, Article 2).

- **Wastewater Infrastructure Plant Management** - the metropolitan municipalities, which are responsible for the construction, maintenance and operation of wastewater infrastructure facilities with the knowledge, and under the control and surveillance, of the local representative of the central government; the municipal administrations in the cities; the industrial zone directorates in the organized and small industrial zones; the free zone directorates in free industrial and/or commercial zones set up by special law; and the Ministry of Culture and Tourism or its authorized units in tourism development project zones (Water Pollution Control Regulation, Article 2).
- **Wastewater Infrastructure Plants** - the sewerage system in which household and/or industrial wastes are collected, together with the complete system and plants where wastewaters are treated and where the final disposal of treated wastewaters are treated and where the final disposal of treated wastewaters is effected (Water Pollution Control Regulation, Article 2).
- **Wastewater Purification** - the physical, chemical and biological treatment unit or units employed to render water, which has become wastewater as a result of various uses, to recover either all or a part of its lost physical, chemical and bacteriological properties and/or to render it such that it will not alter the natural physical, chemical, bacteriological and ecological properties of the receptor medium into which it is discharged (Water Pollution Control Regulation, Article 2).
- **Wastewater Sources** - residences, commercial buildings, industrial enterprises, mines, ore washing and enriching plants, urban areas, agricultural areas, industrial zones, repair shops, workshops, hospitals and other companies, corporations, enterprises or zones that give rise to the creation of wastewaters as a result of their production and other activities, including the following:
  - in every wastewater basin, the major sources of pollutant industrial wastewater whose pollution load, as expressed in terms of wastewater flow or any other pollution parameter (kilogram (kg)/day) or other appropriate unit, is more than 1 percent of the total flow and pollution load borne by the sewerage system in that basin, or whose daily flow in industrial wastewaters is more the 50 cubic meter ( $m^3$ ), or which contains dangerous or hazardous wastes
  - small wastewater sources which have no major pollutant properties in terms of the type and amount of any pollution parameters they contain and whose wastewater flow is less than 50  $m^3$  per day (Water Pollution Control Regulation, Article 2).
- **Water Collection Basin** - the whole of the region in which the surface and groundwaters that feed water resources such as lakes or reservoirs collect; the area near the source of a river which feeds a certain segment of the river (Water Pollution Control Regulation, Article 2).



- ***Water Pollution*** - the discharge of substances or of energy, the effects of which are observable in deterioration of the chemical, physical, bacteriological, radioactive or ecological properties of a water resource, which are directly or indirectly inimical to biological resources, human health or fishing, and which impair the quality of the water for other purposes (Water Pollution Control Regulation, Article 2).
- ***Water Pollution Control Standards*** - limit values prescribed for subjecting water masses, use of which is planned for specific purposes, to quality inspection in accordance with existing water quality criteria, and for preventing a further deterioration of water quality. Such standards are as follows:
  - receptor medium standards, prescribed for preventing deterioration of the quality characteristics of water masses regarded as receptor media due to wastewater discharges
  - discharge standards, which limit the quality characteristics of discharged wastewater for the same purpose (Water Pollution Control Regulation, Article 2).
- ***Water Quality Criteria*** - the physical, chemical and biological properties expected in water resources with respect to conformity to present or anticipated classes of use, in order to establish a basis for protection of water resources and use planning in accordance with the preservation of all such resources as balanced and healthy media, regardless of whether or not their specific uses have been determined (Water Pollution Control Regulation, Article 2).



**WATER QUALITY MANAGEMENT**  
**GUIDANCE FOR CHECKLIST USERS**

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	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: (*)
All Installations	10-1 through 10-3	(1)(2)
Water Uses	10-4 through 10-7	(1)(2)
Drinking Water	10-8 through 10-13	(2)
Wastewater Quality	10-14 through 10-31	(1)(3)
Ocean Dumping	10-32	(1)(2)(3)
Irrigation	10-33 through 10-35	(1)(2)(3)

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**(\*) CONTACT/LOCATION CODE:**

- (1) BCE (Environmental Planning)
- (2) BEE (Bioenvironmental Engineering)
- (3) Wastewater Treatment Plant Superintendent



## **WATER QUALITY MANAGEMENT**

### **Records to Review**

- Bacterial and chemical analyses of drinking water, including sampling dates and locations, dates of analyses, analytical methods used, and results of analyses
- Monthly operating reports (flow, chlorine residual, etc.)
- Records of planning and construction of injection wells
- Results of injection well monitoring
- Records of facility projects, including any petition for review, that may potentially cause contamination of a sole source aquifer through its recharge zone
- Discharge monitoring reports for the past year
- Laboratory records and procedures
- Monthly operating reports for wastewater treatment facilities
- Flow monitoring calibration certification and supporting records
- Ash pond volume certification and supporting records
- Red water inspection records
- Spill Prevention, Control, and Countermeasures (SPCC) Plan
- All records required by SPCC
- Sewage treatment plant operator certification
- Sewer and storm drain layout

### **Physical Features to Inspect**

- Drinking water collection, treatment, and distribution facilities
- On-base laboratory analysis facilities
- Underground injection wells
- Discharge outfall pipes
- Wastewater treatment facilities
- Industrial treatment facilities
- Streams, rivers, open waterways
- Floor and sink drains (especially in industrial areas)
- Stormwater collection points (especially in industrial areas)
- Oil storage tanks
- Oil/water separators

### **Sources to Interview**

- **BCE (Base Civil Engineer)**
- **Environmental Planning**
- **Environmental Coordinator**
- **Natural Resources Planner**
- **BEE (Bioenvironmental Engineering)**
- **Wastewater Treatment Plant Superintendent**

**COMPLIANCE CATEGORY:  
WATER QUALITY MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
<p><b>ALL INSTALLATIONS</b></p> <p><b>10-1.</b> Determine actions or changes since previous review of water quality (GMP).</p> <p style="text-align: center;">...</p> <p><b>10-2.</b> Copies of all relevant Turkish laws and regulations should be maintained at the installation (GMP).</p> <p style="text-align: center;">...</p> <p><b>10-3.</b> Installations will meet regulatory requirements issued since the finalization of the manual (A finding under this checklist item will have the citation of the new regulation as a basis of finding.)</p> <p style="text-align: center;">...</p>	<p>Determine, by reviewing a copy of the previous review report, if non-compliance issues have been resolved. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <ul style="list-style-type: none"> <li>- <i>Water Pollution Control Regulation</i>, 4 September 1988.</li> <li>- <i>Communique on Harmful and Dangerous Substances</i>, 12 March 1989.</li> </ul> <p style="text-align: center;">...</p> <p>Determine if any new regulations concerning water quality have been issued since the finalization of the manual. (1)</p> <p>Verify that the installation is in compliance with newly issued regulations. (1)</p> <p style="text-align: center;">...</p>

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>WATER USES</b></p> <p><b>10-4.</b> The uses of inland surface water are restricted according to the quality of the water source (Water Pollution Control Regulation, Section 3, Article 7).</p> <p>...</p> <p><b>10-5.</b> The uses of groundwater are restricted according to the quality of the water source (Water Pollution Control Regulation, Section 3, Article 12).</p> <p>...</p> <p><b>10-6.</b> The abstraction of groundwater in coastal regions is subject to specific restrictions (Water Pollution Control Regulation, Section 4, Article 22, para B.)</p> <p>...</p>	<p>Determine the quality class of each source of inland surface water used on the installation, using the standards given in Table 10-1. (1)(2)</p> <p>Verify that only Class I inland surface water is used for:</p> <ul style="list-style-type: none"> <li>- drinking water following disinfection</li> <li>- recreational purposes, including swimming and other sports involving bodily contact with water</li> <li>- propagation of trout</li> <li>- animal production and farming.</li> <li>- other purposes</li> </ul> <p>Verify that only class I or II inland surface water is used for:</p> <ul style="list-style-type: none"> <li>- drinking water following advanced or appropriate purification</li> <li>- propagation of fish other than trout</li> <li>- irrigation, in compliance with the water criteria for irrigation water stated in the Technical Methods Communique.</li> </ul> <p>Verify that Class III inland surface water is only used after being treated to supply industrial water in industries, other than foodstuffs and textiles, which require quality water.</p> <p>...</p> <p>Determine the quality class of each source of groundwater used on the installation, using the standards given in Table 10-1. (1)(2)</p> <p>Verify that only Class I groundwater is used for drinking water following disinfection or in the food industry.</p> <p>Verify that only Class I or II water is used for:</p> <ul style="list-style-type: none"> <li>- drinking water after purification</li> <li>- agricultural water</li> <li>- animal production</li> <li>- industrial cooling water.</li> </ul> <p>Verify that Class III groundwater is used only for purposes consistent with the degree of purification possible and with due regard for health.</p> <p>...</p> <p>Verify that the abstraction of groundwater in coastal areas of the installation does not promote the encroachment of salt water into groundwater. (1)(2)</p> <p>...</p>

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**COMPLIANCE CATEGORY:  
WATER QUALITY MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>10-7.</b> Excavations to obtain sand from areas inside a groundwater feeding basin are prohibited (Water Pollution Control Regulation, Section 4, Article 22, para O).</p> <p style="text-align: center;">...</p> <p><b>DRINKING WATER</b></p> <p><b>10-8.</b> Reservoirs and other water resources used for drinking and other purposes are subject to protective regulations (Water Pollution Control Regulation, Section 4, Article 16).</p> <p style="text-align: center;">...</p>	<p>Verify that excavations to obtain sand from a groundwater feeding basin are prohibited on the installation. (1)(2)</p> <p style="text-align: center;">...</p> <p>Verify that activities that will cause the pollution of waters either in, or in the vicinity of, drinking and bathing water reservoirs are not done. (2)</p> <p>Verify that wastes such as garbage or debris are not dumped into water resources.</p> <p>Verify that use of boats, motor boats, and other craft using liquid fuel is prohibited on drinking and bathing water reservoirs unless permission is granted by the General Directorate or the Regional Directorate.</p> <p>Verify that there is no dumping of bilge or wastewater from boats, even if purified.</p> <p>Verify that contract fishing, except by official permit, is not done in reservoirs used for supplying drinking water.</p> <p>Verify that the following activities are prohibited within 300 m of a sampling point:</p> <ul style="list-style-type: none"> <li>- swimming</li> <li>- fishing</li> <li>- hunting</li> <li>- picnicking.</li> </ul> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
WATER QUALITY MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>10-9.</b> Absolute protection zones surrounding sources of drinking water are required to be protected (Water Pollution Control Regulation, Section 4, Article 17).</p> <p style="text-align: center;">...</p>	<p>Determine whether any parts of the installation fall within an absolute protection zone. (2)</p> <p>Verify that the following activities are prohibited in the absolute protection zones, except in officially designated areas at least 300 m from the water supply plant:</p> <ul style="list-style-type: none"> <li>- picnicking</li> <li>- swimming</li> <li>- fishing</li> <li>- hunting.</li> </ul> <p>Verify that no construction of new buildings is undertaken in the absolute protection zone, except water supply facilities and improved sewerage facilities.</p> <p>Verify that the absolute protection zone is enclosed by a fence or protected area, as determined by the Turkish Administration.</p> <p style="text-align: center;">...</p>
<p><b>10-10.</b> Proximate protection zones surrounding sources of drinking water are required to be protected (Water Pollution Control Regulation, Section 4, Article 18).</p> <p style="text-align: center;">...</p>	<p>Determine whether any parts of the installation fall within a proximate protection zone. (2)</p> <p>Verify that the following activities are prohibited in proximate protection zones:</p> <ul style="list-style-type: none"> <li>- dwellings or tourist or industrial installations</li> <li>- deposit of garbage or debris</li> <li>- excavations, except: <ul style="list-style-type: none"> <li>- those provided by the Law for the Protection of Cultural and Natural Resources</li> <li>- for the construction of water-supply facilities</li> </ul> </li> <li>- storage of solid or liquid fuels</li> <li>- use of the land for cemeteries</li> <li>- outdoor cafes or refreshment stands, except by permit</li> <li>- use of artificial fertilizers or pesticides</li> <li>- use of farming methods that exacerbate erosion</li> <li>- activities on roads, other than transportation.</li> </ul> <p style="text-align: center;">...</p>
<p><b>10-11.</b> Intermediate protection zones surrounding sources of drinking water are required to be protected (Water Pollution Control Regulation, Section 4, Article 19).</p>	<p>Determine whether any parts of the installation fall within a intermediate protection zone. (2)</p> <p>Verify that the following activities are prohibited in intermediate protection zones:</p> <ul style="list-style-type: none"> <li>- establishment of industrial plants or residences</li> <li>- use of wastewater for irrigation, except as provided for in the "Communique on Technical Procedures"</li> <li>- opening or operating a mine</li> <li>- use of artificial fertilizers and pesticides</li> <li>- dumping or disposal of garbage.</li> </ul>

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TURKEY**

<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>10-12.</b> Remote protection zones surrounding sources of drinking water are subject to protective regulations (Water Pollution Control Regulation, Section 4, Article 20).</p> <p style="text-align: center;">...</p> <p><b>10-13.</b> Wells, springs, and infiltration galleries from which Classes I and II groundwater are obtained for the mass supply of drinking water are required to be protected (Water Pollution Control Regulation, Section 4, Article 22, paras D and E).</p> <p style="text-align: center;">...</p>	<p>Determine whether any parts of the installation fall within a remote protection zone. (2)</p> <p>Verify that no new industry producing liquid, gaseous or solid wastes of a polluting nature is established in a remote protection zone.</p> <p>Verify that no waste or wastewater of any kind is discharged into any of the waters, rivers or dry stream beds that feed a drinking and bathing water reservoir.</p> <p>Verify that the necessary measures are taken against contamination of drinking and bathing water reservoirs by air pollution or soil erosion.</p> <p>(NOTE: Permission may be granted to existing industries and residences to discharge wastewater in a remote protection zone.)</p> <p style="text-align: center;">...</p> <p>Verify that no solid or liquid waste is discharged or passed within 50 m of groundwater sources. (2)</p> <p>Verify that no buildings are constructed within 50 m of groundwater sources.</p> <p>Verify that groundwater sources are surrounded by a barbed wire fence.</p> <p>(NOTE: The size of the protective zone may be increased or decreased by the Turkish Administration.)</p> <p style="text-align: center;">...</p>

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**COMPLIANCE CATEGORY:  
WATER QUALITY MANAGEMENT  
TURKEY**

<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>WASTEWATER QUALITY</b></p> <p><b>10-14.</b> A permit is required for the discharge of any pollutant into water (Water Pollution Control Regulation, Section 2, Article 3).</p> <p style="text-align: center;">...</p> <p><b>10-15.</b> The discharge of untreated household wastewater into certain bodies of water is prohibited (Water Pollution Control Regulation, Section 4, Article 21).</p> <p style="text-align: center;">...</p> <p><b>10-16.</b> The discharge of treated wastewater into bodies of water is subject to specific requirements (Water Pollution Control Regulation, Section 4, Article 21 and Section 5, Article 32).</p> <p style="text-align: center;">...</p> <p><b>10-17.</b> The disposal of wastewaters must be carried out by means of a sewage system (Water Pollution Control Regulation, Section 5, Article 25, paras A and B).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation has a permit issued by the Turkish government for any discharge of pollutants. (1)(3)</p> <p style="text-align: center;">...</p> <p>Verify that untreated household wastewater from the installation is not discharged into reservoirs, lakes or ponds that are used for supplying bathing or drinking water. (1)(3)</p> <p>Verify that untreated household wastewater from the installation is not disposed of by deepsea discharge.</p> <p style="text-align: center;">...</p> <p>Verify that household wastewater discharged from the installation into water receptor media either directly from household wastewater sources or following treatment conforms to the standards given in Tables 10-2 and 10-3. (1)(3)</p> <p>(NOTE: Applicable standards are based on population served.)</p> <p>Verify that household wastewater discharged into lakes is purified in a tertiary treatment plant to remove nitrogen and phosphorus.</p> <p style="text-align: center;">...</p> <p>Verify that the wastewaters from the installation are disposed of through a sewage system. (1)(3)</p> <p>Verify that no sewage system is destroyed or used for other purposes.</p> <p style="text-align: center;">...</p>

(1) BCE (Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Wastewater Treatment Plant Superintendent

**COMPLIANCE CATEGORY:  
WATER QUALITY MANAGEMENT  
TURKEY**

REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>10-18.</b> The wastewaters discharged into a sewerage system are subject to specific requirements (Water Pollution Control Regulation, Section 5, Article 25, para D).</p> <p style="text-align: center;">...</p>	<p>Verify that wastewaters discharged into a sewerage system do not: (1)(3)</p> <ul style="list-style-type: none"> <li>- cause damage to the structure or impede the operation of the sewerage system</li> <li>- create any health hazards for sanitation personnel or for nearby residents</li> <li>- have any undesirable effects on the operation and efficiency of the treatment plants to which the sewerage system is connected</li> <li>- contain any substances which cannot be treated by traditional biological purification</li> <li>- make the removal or use of the sludge and similar wastes created at a wastewater treatment plant more difficult or cause them to acquire properties that would give rise to environmental pollution.</li> </ul> <p style="text-align: center;">...</p>
<p><b>10-19.</b> Installations that discharge directly into a water receptor medium are responsible for the monitoring and documentation of pollution at regular intervals (Water Pollution Control Regulation, Section 5, Article 26).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation monitors and documents its discharges of wastewater. (1)(3)</p> <p>Verify that the installation maintains records of the measurement and monitoring of wastewaters for at least three years (yr).</p> <p style="text-align: center;">...</p>
<p><b>10-20.</b> The discharge of wastewaters outside cities is subject to specific requirements (Water Pollution Control Regulation, Section 5, Article 26, para A).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation, if located outside a city, uses an individual or common treatment plant for the purification of wastewaters before discharge into a water receptor medium. (1)(3)</p> <p style="text-align: center;">...</p>
<p><b>10-21.</b> The discharge of wastewaters inside cities is subject to specific requirements (Water Pollution Control Regulation, Section 5, Article 26, para A).</p> <p style="text-align: center;">...</p>	<p>Verify that if the installation discharges into a city sewerage system, it conforms to the principles governing connection with the system. (1)(3)</p> <p>(NOTE: Industries producing wastes similar in nature within cities shall investigate the feasibility of building a common wastewater infrastructure plant for treating their waste.)</p> <p style="text-align: center;">...</p>

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<b>REGULATORY REQUIREMENTS</b>	<b>REVIEWER CHECKS:</b>
<p><b>10-22.</b> The quality of wastewater discharged into water receptor media, including irrigation canals and drainage canals, is subject to specific requirements (Water Pollution Control Regulation, Section 5, Article 26, para B through D).</p> <p>...</p>	<p>Verify that the installation does not dilute wastewater with: (1)(3)</p> <ul style="list-style-type: none"> <li>- rainwater</li> <li>- cooling waters</li> <li>- slightly polluted wash water</li> <li>- other slightly polluted waters.</li> </ul> <p>Verify that the discharge of hazardous wastes in wastewater conforms to the conditions and limit values given in the "Communique on Dangerous and Hazardous Substances," see Table 3-1 in the <i>Hazardous Waste Management</i> section for a list of wastes.</p> <p>Verify that none of the following is discharged into water receptor media:</p> <ul style="list-style-type: none"> <li>- solid wastes or effluents of all kinds</li> <li>- treatment sludge</li> <li>- septic sludge.</li> </ul> <p>Verify that the standards in Table 10-4 are met.</p> <p>...</p>

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REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>10-23.</b> Certain activities and operations on the installation are required to meet specific discharge standards (Water Pollution Control Regulation, Section 5, Article 26, paras E through F; Article 27; and Article 31).</p> <p style="text-align: center;">...</p>	<p>Verify that the quality of wastewater discharged for the following sources into water receptor media conforms to the standards for the specific industry given in the indicated Table: (1)(3)</p> <ul style="list-style-type: none"> <li>- thermal treatment plants, Table 10-5</li> <li>- geothermal resources, Table 10-6</li> <li>- energy production cooling water, Table 10-7</li> <li>- energy production closed circuit industrial cooling waters, Table 10-8</li> <li>- fuel oil and coal-fired boiler cooling waters, Table 10-9</li> <li>- electrolytic plating, Table 10-10</li> <li>- hot galvanizing zinc plating, Table 10-11</li> <li>- conductive plate manufacture, Table 10-12</li> <li>- automotive and tractor repair shops, Table 10-13</li> <li>- mixed industries, Table 10-14</li> <li>- industrial wastewaters (industrial cooling waters etc.), Table 10-15</li> <li>- exit waters from filters used to control air pollution, Table 10-16</li> <li>- gas stations and car washes, Table 10-17</li> <li>- backwash water of drinking water filters, Table 10-18</li> <li>- solid waste recycling and disposal plants, Table 10-19</li> <li>- water softening, demineralization and regeneration, active carbon washing and regeneration plants, Table 10-20.</li> </ul> <p>(NOTE: These standards do not apply in plants which operate on an entirely dry basis.)</p> <p>(NOTE: If the same industrial establishment encompasses more than one sector of industry, the most stringent standards shall apply.)</p> <p>(NOTE: If the installation can document that the water it has obtained and used from a water medium of any kind has been discharged back into the same water medium without any change in its quality, it is not regarded as having infringed discharge standards for the amount of water in question. If it uses waters which are polluted by the discharge standards for the relevant industry, it is responsible for ensuring that the wastewater it discharges is not more polluted than the water originally taken.)</p> <p style="text-align: center;">...</p>
<p><b>10-24.</b> Treatment of wastewater is subject to specific regulations (Water Pollution Control Regulation, Section 5, Article 30).</p> <p style="text-align: center;">...</p>	<p>Verify that the treatment of wastewater on the installation conforms to the requirements stated in the "Communique on Technical Procedures." (1)(3)</p> <p>Verify that the treatment method is chosen with a view to preventing air pollution, soil pollution, and pollution by solid wastes.</p> <p style="text-align: center;">...</p>

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT TURKEY	
REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>10-25.</b> Deepsea discharges of wastewater are subject to specific requirements (Water Pollution Control Regulation, Section 5, Articles 34 through 36; the Communiqué on Dangerous and Hazardous Substances, Article 5).</p> <p>...</p> <p><b>10-26.</b> Owners of property within the boundaries of authority of a wastewater infrastructure plant are required to link their wastewater disposal systems with it (Water Pollution Control Regulation, Section 7, Articles 43 and 48).</p> <p>...</p> <p><b>10-27.</b> The types of wastewater discharged into a sewerage system belonging to a wastewater infrastructure plant are subject to specific restrictions (Water Pollution Control Regulation, Section 7, Article 45, paras A, D, and E).</p>	<p>Verify that the installation has a permit issued by the Mayor's Office of a Metropolitan Municipality or the local representatives of the central Turkish government for any deepsea discharge of wastewater. (1)(3)</p> <p>Verify that deepsea discharges of wastewaters do not exceed:</p> <ul style="list-style-type: none"> <li>- a maximum of 0.1 mg/L for substances in STS 4 class</li> <li>- a maximum of 10 mg/L for substances in STS 3 class.</li> </ul> <p>(NOTE: See Table 10-21 for a list of substances in STS 3 and STS 4 class. A table of substance name translations is found in Table 2-2, <i>Hazardous Materials Management</i>.)</p> <p>Verify that wastewaters given deepsea discharge conform to the quality standards given in Tables 10-22 and 10-23.</p> <p>Verify that deepsea discharges are carried out at a depth of no less than 20 m.</p> <p>(NOTE: If it is not economically unfeasible to descend to this depth, the length of the discharge pipe, diffuser excluded, from the average coastline must be not less than:</p> <ul style="list-style-type: none"> <li>- 500 m for a flow of 200 m<sup>3</sup>/day (Population &lt;1000)</li> <li>- 1300 m for a flow of 200-2000 m<sup>3</sup>/day (Population 1000 - 10,000)</li> </ul> <p>(NOTE: For purposes of this protocol, deepsea discharge includes discharges into semiencllosed bays, gulfs, estuaries, mouths of rivers, lagoons and similar environments.)</p> <p>...</p> <p>Determine whether the installation lies within the boundaries of authority of a wastewater infrastructure plant. (1)(3)</p> <p>Verify that the installation, if it lies within the boundaries, has linked its wastewater disposal system with the wastewater infrastructure plant.</p> <p>Verify that the installation operates a preliminary treatment system if its wastewaters are determined to be unsuitable for direct connection.</p> <p>...</p> <p>Verify that the installation does not discharge into a sewerage system: (1)(3)</p> <ul style="list-style-type: none"> <li>- rainwater and other non-polluted drainage waters if there is a separate sewerage system</li> <li>- cooling waters not containing pollutants unless authorized by the treatment plant operator</li> <li>- industrial wastewaters diluted with unpolluted waters</li> </ul>

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REGULATORY REQUIREMENTS	REVIEWER CHECKS:
<p><b>10-28.</b> Noncontinuously operating wastewater plants are required to have a balancing tank prior to connection with the sewerage system (Water Pollution Control Regulation, Section 7, Article 45, Section C).</p> <p style="text-align: center;">...</p>	<p>Verify that a non-continuously operating plant has a balancing tank, whether a pre-treatment plant is required or not. (1)(3)</p> <p>Verify that the balancing tank conforms to the regulations given in the "Communique on Wastewater Infrastructure Plants."</p> <p>(NOTE: At plants without balancing tanks, the amounts and pollution loads of the wastewater in question are determined based on the amount and quality of the maximum wastewater that will issue from the plant.)</p> <p style="text-align: center;">...</p>
<p><b>10-29.</b> The disposal of certain substances in wastewater infrastructure plants is prohibited (Water Pollution Control Regulation, Section 7, Article 46).</p> <p style="text-align: center;">...</p>	<p>Verify that the installation does not discharge into a wastewater infrastructure plant any of the substances specified in the <i>Communique on Wastewater Infrastructure Plants</i>, such as substances that have undesirable effects on: (1)(3)</p> <ul style="list-style-type: none"> <li>- the efficiency of the treatment plant</li> <li>- the operation of the activated sludge treatment</li> <li>- the disposal or re-use of sludge.</li> </ul> <p>Verify that substances which cause damage to wastewater plants, or that obstruct, render difficult or threaten their functions and maintenance or cause harm to individuals working at the plants are not discharged.</p> <p>Verify that the installation does not use a garbage grinder as a preliminary to introducing garbage or other solid wastes into a wastewater infrastructure plant.</p> <p style="text-align: center;">...</p>
<p><b>10-30.</b> Industrial wastewaters defined as "major pollutant wastewater sources" are required to meet specific standards in order to be accepted at wastewater infrastructure plants (Water Pollution Control Regulation, Section 7, Article 47).</p> <p style="text-align: center;">...</p>	<p>Determine whether the installation discharges wastewaters defined as major pollutant wastewaters into a wastewater infrastructure plant. (1)(3)</p> <p>Verify that such waters meet the standards given in Table 10-24.</p> <p style="text-align: center;">...</p>
<p><b>10-31.</b> A control vent is required for connections to the sewerage system (Water Pollution Control Regulation, Section 7, Article 49).</p> <p style="text-align: center;">...</p>	<p>Verify that the wastewater facility has a control vent either at the point of connection with the sewerage system or within easy reach of the preliminary treatment plant exit. (1)(3)</p> <p style="text-align: center;">...</p>

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<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>OCEAN DUMPING</b></p> <p><b>10-32.</b> The dumping of certain substances into the sea prohibited (Water Pollution Control Regulation, Section 4, Article 23).</p> <p style="text-align: center;">...</p>	<p>Verify that no substance for which official permission is required is dumped by the installation into the sea, coastal waters, or nearby waters that could affect sea or coastal waters. (1)(2)(3)</p> <p>Verify that ships and aircraft based on the installation do not discharge bilge, ballast, garbage, or household or industrial wastewaters into seas under Turkish jurisdiction.</p> <p>Verify that septic tanks located on or near the sandy strip along the shore comply with the "Communique on Technical Procedures."</p> <p>Verify that the installation does not dispose of the following into the sea or coastal waters:</p> <ul style="list-style-type: none"> <li>- excavation debris</li> <li>- rubble</li> <li>- sludge from sea floor dredging</li> <li>- purification and process effluent</li> <li>- other wastes.</li> </ul> <p>(NOTE: The disposal in the open sea of the remains of seafood, fish, sponges and other marine products in connection with fishing and similar activities is not subject to permission in areas outside harbors, ports and gulfs.)</p> <p style="text-align: center;">...</p>
<p><b>IRRIGATION</b></p> <p><b>10-33.</b> The use of wastewater for irrigation is subject to specific restrictions (Water Pollution Control Regulation, Section 4, Article 22, para J and Section 5, Article 28).</p> <p style="text-align: center;">...</p>	<p>Verify that any use of wastewater for irrigation on the installation is done in such a way as to reduce to a minimum the risk of persistent pollution of groundwater due to seepage. (1)(2)(3)</p> <p>Verify that wastewaters used in irrigation meet the quality standards given in the "Communique on Technical Procedures."</p> <p style="text-align: center;">...</p>
<p><b>10-34.</b> The disposal of hazardous materials in waters for any reason is strictly prohibited (Water Products Law, Article 20).</p> <p style="text-align: center;">...</p>	<p>Verify that no hazardous materials are disposed of in waters. (1)(2)(3)</p> <p style="text-align: center;">...</p>

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<b>REGULATORY REQUIREMENTS:</b>	<b>REVIEWER CHECKS:</b>
<p><b>10-35.</b> Permits from the State Waterworks' General Directorate are required for excavation or well-digging within Groundwater Management Areas (Law Concerning Groundwaters, Article 4).</p>	<p>Determine whether the installation lies within a Groundwater Management Area. (1)(2)(3)</p> <p>Verify that excavation and/or well-digging take(s) place only with the permission of the State Waterworks' General Directorate. (1)(2)(3)</p> <p>Verify that the installation complies with the following parameters in the permit: (1)(2)(3)</p> <ul style="list-style-type: none"> <li>- amount of water taken</li> <li>- depth</li> <li>- location</li> <li>- number of wells</li> </ul> <p>(NOTE: Wells dug manually are exempt from the permit requirement.)</p>

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**Table 10-1**

**Quality Criteria for Inland Water Resources by Class**

(Water Pollution Control Regulation, Section 3, Articles 8,9, and 12)

Separate quality classes are determined for the parameter groups A, B, C, and D in Table 1, based on the results of analyses conducted on samples collected from a water resource. These classes are based on the quality classes of each parameter within the group. The lowest quality class pertaining to a group determines the group's class.

The mean and standard deviation are calculated for each parameter. Results originating from accidents or obvious errors in analysis are not taken into account in determining characteristic values. The characteristic value corresponds to the 0.90 probability in the probability distribution table. If the characteristic value determined for a parameter measured is smaller than the maximum upper value for a particular water quality class given in Table 1, then the sampling point belongs to that class. It is assumed that pH will remain within the range given for that class and that the lower limits of dissolved oxygen concentration and percentage saturation will be within the range of figures given for that class (Water Pollution Control Regulation, Article 8).

Classifications of lakes and dam reservoirs are not based on dissolved oxygen concentrations and oxygen saturation percentages (Water Pollution Control Regulation, Article 9).

Sampling points for the classification of groundwater are selected by experts. Until such determination has been made, all wells from which groundwater is drawn are sampling points. The frequency of sampling, the minimum period required, the analyses to be made and the determination of a characteristic value shall be done according to the "Communique on Methods of Sampling and Analyses."

Groundwater that meets the quality parameters for Class I is regarded as Class I waters, provided that the required oxygen can be supplied by aeration alone. Groundwater that meets the quality parameters for Class II is regarded as Class II water, but it is not necessary that water of this class conform to the standards for iron, ammonia, manganese and dissolved oxygen. Class IV is not used with regard to groundwater; any groundwater inferior to Class II is classified as Class III (Water Pollution Control Regulation, Article 12).

Table 10-1 (continued)

Water Quality Parameter	Water Quality Class			
A) Physical and inorganic-chemical parameters				
	I	II	III	IV
1. Temperature (°C)	25	25	30	>30
2. pH	6.5-8.5	6.5-8.5	6.0-9.0	outside 6.0-9.0
3. Dissolved oxygen (mg O <sub>2</sub> /L) <sup>a</sup>	8	4	3	<3
4. Oxygen saturation (%) <sup>a</sup>	90	70	40	<40
5. Chlorine ions (mg Cl <sup>-</sup> /L)	25	200	400 <sup>b</sup>	>400
6. Sulfate ions (mg SO <sub>4</sub> /L)	200	200	400	>400
7. Nitrogen as ammonia (mg Nh <sub>4</sub> , N/L)	0.2 <sup>c</sup>	1 <sup>c</sup>	2 <sup>c</sup>	>2 <sup>c</sup>
8. Nitrogen as nitrite (mg NO <sub>2</sub> -N/L)	0.002	0.01	0.05	>0.05
9. Nitrogen as nitrate (mg NO <sub>3</sub> -N/L)	5	10	20	>20
10. Total phosphorus (mg PO <sub>4</sub> , P/L)	0.02	0.16	0.65	>0.65
11. Total dissolved matter (mg/L)	500	1500	5000	5000
12. Color (Pt-Co units)	5	50	300	>300
13. Sodium (mg Na <sup>+</sup> /L)	125	125	250	>250
B) Organic parameters				
	I	II	III	IV
1. COD (mg/L)	25	50	70	>70
2. BOD (mg/L)	4	8	20	>20
3. Organic carbon (mg/L)	5	8	12	>12
4. Total Kjeldahl Nitrogen (mg/L)	0.5	1.5	5	>5
5. Emulsified oil and grease (mg/L)	0.02	0.16	0.65	>0.65
6. Methylene blue active substances (MBAS) (mg/L)	0.05	0.2	1	>1.5
7. Phenolic substances (airborne) (mg/L)	0.002	0.01	0.1	>0.1
8. Mineral oils and derivatives (mg/L)	0.02	0.1	0.5	>0.5
9. Total pesticides (mg/L)	0.001	0.01	0.1	>0.1

Table 10-1 (continued)

Water Quality Parameter	Water Quality Class			
C) Inorganic pollution parameters <sup>d</sup>				
	I	II	III	IV
1. Mercury (micrograms (µg) Hg/L)	0.1	0.5	2	>2
2. Cadmium (µg Cd/L)	3	5	10	>10
3. Lead (µg Pb/L)	10	10	50	>50
4. Arsenic (µg As/L)	20	50	100	>100
5. Copper (µg Cu/L)	20	50	200	>200
6. Chromium (total) (µg Cr/L)	20	20	200	>200
7. Chromium (µg Cr <sup>+6</sup> /L)	indeterminable	20	50	>50
8. Cobalt (µg Co/L)	10	20	200	>200
9. Nickel (µg Ni/L)	20	50	200	>200
10. Zinc (µg Zn/L)	200	500	2000	>2000
11. Cyanide (total) (µg CN/L)	10	50	100	>100
12. Fluorine (µg F/L)	1000	1500	2000	>2000
13. Free chlorine (µg Cl <sub>2</sub> /L)				
14. Sulfur (µg S/L)	2	2	10	>10
15. Iron (µg Fe/L)	300	1000	5000	>5000
16. Manganese (µg Mn/L)	100	500	3000	>3000
17. Boron (µg B/L)	1000 <sup>e</sup>	1000 <sup>e</sup>		1000 <sup>e</sup>
18. Selenium (µg Se/L)	10	10	20	>20
19. Barium	1000	2000	2000	>2000
20. Aluminum (mg Al/L)	0.3	0.3	1	>1
21. Radioactivity	(pCi/L)			
alpha-activity	1	10	10	>10
beta-activity	10	100	100	>100
D) Bacteriological parameters				
	I	II	III	IV
1. Fecal coliforms (MPN/100 milliliter (mL))	10	200	2000	>2000
2. Total coliforms (MPN/100 mL)	100	2000	10000	>10000

(a) It is sufficient to ensure concentration and percentage saturation of only one of the parameters.

(b) It may be necessary to lower the limit of this concentration for irrigation of chlorine-sensitive plants.

(c) The concentration of free ammonia may not exceed 0.02 mg NH<sub>3</sub>-N/L depending on pH.

(d) Criteria in this group give total concentrations of chemical derivatives constituting parameters.

(e) These criteria may have to be lowered to 300  $\mu\text{g}$ /L for irrigation of boron-sensitive plants.





**Table 10-2****Wastewater Discharge Standards for Household Wastewater**  
(Water Pollution Control Regulation, Table 21)**Class 1: Less than 1000 Population and Pollution Load of 60 kg/day untreated BOD**

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	50	45
Chemical oxygen demand (COD)	mg/L	180	120
Suspended solids	mg/L	70	45
pH		6-9	6-9

**Class 2: Population 1,000 to 10,000 and Pollution Load of 60-6,000 kg/day untreated BOD**

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	50	45
Chemical oxygen demand (COD)	mg/L	180	110
Suspended solids	mg/L	60	30
pH		6-9	6-9

**Table 10-2 (continued)**

**Class 3: Population over 10,000 and Pollution Load of more than 600 kg/day untreated BOD**

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	50	45
Chemical oxygen demand (COD)	mg/L	140	100
Suspended solids	mg/L	45	30
pH		6-9	6-9

**Table 10-3**

**Wastewater Discharge Standards for Urban Wastewater Treatment Plants,  
Regardless of Population, Using Biological Purification by means  
of a System of Stabilization Pools  
(Water Pollution Control Regulation, Table 21.4)**

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	75	50
Chemical oxygen demand (COD)	mg/L	150	100
Suspended solids	mg/L	200	150
pH		6-9	6-9



Table 10-4

**Very Dangerous and Harmful Substances for Water Receptor Media**  
(WDC 4)

Index #	Sub- stance Name	Water Solu- bility	Acute Oral Toxicity Mammals	Acute Toxicity # Bacteria	Acute Toxicity # Fish	Danger # H <sub>2</sub> O	Explanat.
10	Acrylonitril	s	5		4.6		A,C
7	Acetone Cyanhydr		7		5.8		C
29	Benzine	1	1800	4.0	4.5	3.2	A
180	Merc(2)chloride	s	5	8	6.3	6.4	
70	p-p'- DDT	0.0012	5				C,D
23	Disodhydrgarsnt	s	5	4.7	4.0	3.9	A
92	Epi Chlorhidrin	hs	5	4.3	4.6	4.6	A
167	Ethyl Paration	24	7		6.3		C,F
108	Ethyl Imino	&	7	5.3	5.7	6.0	A
185	Silver Nitrate	2.1mln	5	8.2	6.4	6.5	
130	Hydrg. hydroxst		7	7.7	6.1	6.9	A
49	Cadm. Nitrate	s	3	7.1	4.2	4.8	
35	Lead Tetra Eth	300					
143	Linden	10	5		6.6		C
144	Merkaptan						F
60	Sodmcynate	s	7	9	7.2	7.7	



**Table 10-5**

**Wastewater Discharge Standards for Thermal Power Plants**  
(Water Pollution Control Regulation, Table 9.3)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	60	30
Suspended solids	mg/L	150	100
Oil and grease	mg/L	20	10
Total phosphorus	mg/L	8	
Total cyanide (CN <sup>-</sup> )	mg/L		0.5
Temperature	°C		35
pH		6-9	6-9





**Table 10-6**

**Wastewater Discharge Standards for Geothermal Resources**  
(Water Pollution Control Regulation, Table 9.5)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	60	30
Oil and grease	mg/L	20	10
Total cyanide (CN <sup>-</sup> )	mg/L		0.5
Temperature	°C	35	30
pH		6-9	6-9



**Table 10-7**

**Wastewater Discharge Standards for Energy Production Cooling Water**  
(Water Pollution Control Regulation, Table 9.6)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Oil and grease	mg/L	20	10
Total suspended solids	mg/L	150	100
Temperature	°C	35	30
pH		6-9	6-9



**Table 10-8**

**Wastewater Discharge Standards for Energy Production  
Closed Circuit Industrial Cooling Waters**  
(Water Pollution Control Regulation, Table 9.7)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	40	
Suspended solids	mg/L	100	
Free chlorine	mg/L	0.3	
Total phosphorus	mg/L	5	
Zinc	mg/L	4.0	



**Table 10-9**

**Wastewater Discharge Standards for Fuel Oil  
and Coal-fired Boiler Cooling Waters**  
(Water Pollution Control Regulation, Table 9.8)

Parameter	Unit	Instant Sample	Composite Sample 2-hour
Precipitable solids	mg/L	0.3	
Hydrazine	mg/L	5	
Total phosphorus	mg/L		8*
Vanadium	mg/L		3**
Iron (Fe)	mg/L		7***

\* To be tested only in boiler blow-off waters.

\*\* To be tested in the waste gas scrubbing waters of fuel oil-fired steam boilers.

\*\*\* To be tested in the waste gases of coal-fired boilers and the waste gas scrubbing waters of air pre-heated plants.





**Table 10-10****Wastewater Discharge Standards for Electrolytic Plating**  
(Water Pollution Control Regulations, Table 15.5)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	100	
Suspended solids	mg/L	125	
Oil and grease	mg/L	20	
Nitrite (NO <sub>2</sub> -N)	mg/L	5	
Active chlorine	mg/L	0.5	
Total chromium	mg/L	1	
Chromium (Cr <sup>+6</sup> )	mg/L	0.5	
Aluminum	mg/L	3	
Fluorine (F <sup>-</sup> )	mg/L	50	
Zinc	mg/L	3	
Fish bioassay (TDF)		2	
pH		6-9	



**Table 10-11****Wastewater Discharge Standards for Electrolytic Plating**  
(Water Quality Control Regulations, Table 15.7)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	100	
Suspended solids	mg/L	125	
Oil and grease	mg/L	20	
Nitrite (NO <sub>2</sub> -N)	mg/L	5	
Active chlorine	mg/L	0.5	
Total chromium	mg/L	1	
Chromium (Cr <sup>+6</sup> )	mg/L	0.5	
Aluminum	mg/L	3	
Fluorine (F <sup>-</sup> )	mg/L	50	
Zinc	mg/L	3	
Fish bioassay (TDF)		2	
pH		6-9	



**Table 10-12****Wastewater Discharge Standards for Conductive Plating Manufacture**  
(Water Pollution Control Regulations, Table 15.9)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	2500	
Suspended solids	mg/L	125	
Oil and grease	mg/L	20	
Ammonia (NH <sub>4</sub> -N)	mg/L	100	
Sulfur (S <sup>-2</sup> )	mg/L	2	
Total chromium	mg/L	1	
Chromium (Cr <sup>+6</sup> )	mg/L	0.5	
Lead (Pb)	mg/L	1	
Total cyanide (CN <sup>-</sup> )	mg/L	0.2	
Iron (Fe)	mg/L	3	
Fluorine (F <sup>-</sup> )	mg/L	50	
Copper	mg/L	2	
Nickel	mg/L	3	
Silver (Ag)	mg/L	0.1	
Fish bioassay (TDF)		10	
pH		6-9	



**Table 10-13****Wastewater Discharge Standards for Automobile and Tractor Repair Shops**  
(Water Pollution Control Regulation, Table 18.1)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Oil and grease	mg/L	20	10
Ammonia (NH <sub>4</sub> -N)	mg/L	100	
Total cyanide (CN <sup>-</sup> )	mg/L	1	0.2
Total phosphorus	mg/L	2	1
Total chromium	mg/L	2	1
Fish bioassay (TDF)		10	
pH		6-9	6-9





**Table 10-14**

**Wastewater Discharge Standards in Mixed Industries  
(Small and Large Organized Industrial Zones, and Unclassifiable Industries)  
(Water Pollution Control Regulation, Table 19)**

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	100	50
Chemical oxygen demand (COD)	mg/L	160	100
Suspended solids	mg/L	200	100
Oil and grease	mg/L	20	10
Total phosphorus	mg/L	2	1
Total chromium	mg/L	0.5	0.5
Chromium (Cr <sup>+6</sup> )	mg/L	0.5	0.5
Lead (Pb)	mg/L	2	1
Total cyanide (CN <sup>-</sup> )	mg/L	1	0.5
Cadmium (Cd)	mg/L	0.1	
Iron (Fe)	mg/L	10	
Fluorine (F <sup>-</sup> )	mg/L	15	
Copper	mg/L	3	
Nickel	mg/L	5	
Zinc	mg/L		
Mercury (Hg)	mg/L		0.05
Fish bioassay (TDF)		10	10
pH		6-9	6-9



**Table 10-15**

**Wastewater Discharge Standards for Industrial Wastewater**  
**(Industrial Cooling Waters, etc.)**  
(Water Pollution Control Regulation, Table 20.1)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	200	150
Oil and grease	mg/L	20	10
Fish bioassay (TDF)		5	
Temperature	°C	35	30
pH		6-9	6-9



**Table 10-16**

**Wastewater Discharge Standards for Exit Waters  
from Filters Used to Control Air Pollution  
(Water Pollution Control Regulation, Table 20.2)**

<b>Parameter</b>	<b>Unit</b>	<b>Composite Sample 2-hour</b>	<b>Composite Sample 4-hour</b>
Chemical oxygen demand (COD)	mg/L	250	200
Suspended solids	mg/L	150	100
Sulfate ( $\text{SO}_4^{-2}$ )	mg/L	2500	1500
Fish bioassay (TDF)		10	
Temperature	$^{\circ}\text{C}$	35	30
pH		6-9	6-9



**Table 10-17**

**Wastewater Discharge Standards for Gas Station and Car Wash Wastewaters**  
(Water Pollution Control Regulation, Table 20.3)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	200	150
Oil and grease	mg/L	20	10
Fish bioassay (TDF)		20	
pH		6-9	6-9





**Table 10-18**

**Wastewater Discharge Standards for Backwash Waters of Drinking Water Filters**  
(Water Pollution Control Regulation, Table 20.5)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chemical oxygen demand (COD)	mg/L	100	70
Suspended solids	mg/L	150	100
pH		6-9	6-9



**Table 10-19**

**Wastewater Discharge Standards for Solid Waste Recycling and Disposal Plants**  
(Water Pollution Control Regulation, Table 20.6)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Biochemical oxygen demand (BOD <sub>5</sub> )	mg/L	100	50
Chemical oxygen demand (COD)	mg/L	160	100
Suspended solids	mg/L	200	100
Oil and grease	mg/L	20	10
Total phosphorus	mg/L	2	1
Total chromium	mg/L	0.5	0.5
Chromium (Cr <sup>+6</sup> )	mg/L	0.5	0.5
Lead (Pb)	mg/L	2	1
Total cyanide (CN <sup>-</sup> )	mg/L	1	0.5
Cadmium (Cd)	mg/L	0.1	
Iron (Fe)	mg/L	10	
Fluorine (F <sup>-</sup> )	mg/L	15	
Copper	mg/L	3	
Zinc	mg/L	5	
Fish bioassay (TDF)		10	
pH		6-9	6-9



**Table 10-20**

**Wastewater Discharge Standards for Water Softening, Demineralization  
and Regeneration, Active Carbon Washing and Regeneration Plants**  
(Water Pollution Control Regulations, Table 20.7)

Parameter	Unit	Composite Sample 2-hour	Composite Sample 4-hour
Chlorine ( $\text{Cl}^-$ )	mg/L	2000	1500
Sulfate ( $\text{SO}_4^{2-}$ )	mg/L	3000	2500
Iron (Fe)	mg/L	10	
Fish bioassay (TDF)		10	
pH		6-9	6-9



Table 10-21

### Dangerous and Harmful Substances Classified as STS3 or STS4

(Communique on Dangerous and Harmful Substances, Annex 1)

Index #	Substance Name	Water Solu-bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac-terias	Acute Toxcty Fish	Danger # Water	Exptntns.
9	Acryolin	265000	5	6.7	5.6	5.8	
14	Allilamin	&	5	3.2	4.2	4.1	
20	Anilin	34000	3	3.9	4.2	3.7	F
21	Anisol	hs	5		3.9		C
1	Acetalydhyde	&	3		3.9		C,F
5	Acetateacid methylesther	350000			F		
8	Acetonitril	&	1	3.2	2.2	2.1	
24	Atrazene	70	1		4.5		C
141	Copperdisulfate	s	3	7.5	6.1	5.5	
33	Benzelchloride	hs	3	5.3	5.5	4.6	
31	Benzonitril	hs	5	5.0	4.0	4.7	
34	Beryliumnitrate	s	1	7.7	4	4.2	A
76	1,2 diethylbenz	200	3		4.5		C
74	2,4 dichlorbenz	150	3	4.8	4.5	4.1	
75	2,3 dichlorphenl	4,500	3	5.2	5.3	4.5	C
82	2,4 dimethylanln	hs	3	5.1	3.7	3.9	E
73	Di-n-butilate	s			4.2		C
84	1,3 dinitrobenz	650	5	4.9	5	5	
85	Dinirbutolphenol	50	5		5.7		C,F
103	Ethyl diamine	&	3	6.1	3.4	4.2	
109	2-ethyl hexsilam	s	3	4.1	4.8	4.0	
102	ethyline chlorid	8650	3	3.9	3.5	3.5	
171	Phenylacetate	1000	3	3.9	4.9	3.9	E
170	Phenol	82000	3	4.2	4.6	3.9	E
173	Phtalicaciddiaslt	hs	3	4	6.4	4.5	
112	Formaldehyde	s	3	4.9	4.0	4.0	
	35% by volume soluble						
119	Fuel Oil(163/345)	5	1				C
113	Furfurol	83000	5	4.8	4.5	4.8	
115	Gasoil(172/323)	5	1				C
117	Glycacid butol est	46000					F
123	Hexachlorbutane	hs	3				E
128	Hydroquinone	72000	3	4.2	6.8	4.7	
134	Isooctanol	s	4.2	4.6		C	
50	Karbaril	<1000	3		4.7		C,F
189	Carb tetra chloride	770	1	4.5	4.0	3.2	
139	Kerosene (158/246)	10	1				C

Table 10-21 (continued)

Index #	Substance Name	Water Solu- bility	Acute Oral Toxcty Mammal	Acute Toxcty Bac- terias	Acute Toxcty Fish	Danger # Water	Exptlns.
51	Chlorhydrate	&	3	5.8	2.8	3.9	E
53	Chlorbenzene	490	1	4.8	7.7	4.2	
157	Chlor phen metox methyolate	580	1	5	4.1	3.4	
54	Choloroform	8200	1	3.9	3.8	2.9	B
55	2-Chlortoluene	hs	1	4.8	4.1	3.3	
140	m-Cresole	31000	3	4.3	4.7	4.0	
206	ylene	200	3		4.1		C,F
59	Kumol Hydrperox	hs	3		4.9		C
35	Lead 2-acetate	s	1	5.7	3.2	3.3	D,F
183	Carbon Sulfate(CS <sub>2</sub> )	2200	3		4.0		C
76	Diesel(161/334)	5	1				C
147	Methyl acrylate	60000	5	4.3	5.1	4.8	
145	Methy acetate	292000					F
149	Methylene chloride	20000	1	3.3	3.3	2.5	
155	Mineral turpentine	20	1				C
156	Monoflor acetic acid		7	4.2	3.6	4.9	
159	Nickel chlorate	550000	5	8.5	3.2	5.6	B
132	Nitrilisobutirate	ls	5		3.6		C
162	4-Nitroaniline	600	3	5.4	4.5	4.3	
163	Nitrobenzene	1900	3	5.2	4.2	4.1	
164	2-Nitrotoluene	a 40	3	4.7	4.5	4.1	
27	Petrolether(40/71)	50	1				C
28	petrolether(61/135)	40	1				C
175	Picratacid (50% soluble)	&	5	3.0	3.5	3.8	E
179	Pridine	&	3	3.5	3.6	3.4	F
177	2-Propinol-1	1	5	3.8	5.7	4.8	
181	Salycilaldehyde	1700	3	5.0	5.4	4.5	
67	Cyclohexilamine	s	5	3.4	3.7	4.0	
56	Sodiumdichromate	s	3	6.1	3.7	4.3	A
161	Sodiumnitrate	s	7	3.9	3.5	4.8	
184	Sodiumselenite	a s	7	4.7	4.0	5.2	
188	Sodiumsulfur	180000	7	5.8	4.6	5.8	
186	Naphta solvent (186/210)		15	1			C
187	Styrene	320	1	4.1	4.8	3.3	F
192	Thallium 1-nitrate	96000	5		3.7		C
194	Toluene	470	1	4.5	4.2	3.2	F
195	O-Toludine	15000	3	4.8	3.9	3.9	B,E
198	1,1,1-Trichlorethane	1300	1	4.0	3.9	3.0	
199	Trichlorethylene	1000	1	4.2	3.9	3.0	B
203	Vinyl acetate	20000	1	5.2	4.6	3.6	F
204	VKNormal	160	1		4.4		C
205	VKSuper	380	1		5.7		C



**Table 10-22**

**Properties of Wastewaters Permitted in Deepsea Discharges**  
(Water Pollution Control Regulation, Table 22)

Parameter	Class	Remarks
pH	6-9	
Temperature	35 °C	
Suspended solids (mg/L)	350	
Oil and grease	10	
Floating materials	None	
5-day Biochemical oxygen demand (BOD <sub>5</sub> )	250	
Chemical oxygen demand (COD) (mg/L)	400	
Total nitrogen (mg/L)	40	
Total phosphorus (mg/L)	10	
Surface active substances (mg/L)	10	Discharges of substances decomposition of which is in line with Turkish Standards is impossible is prohibited on principle.
Other parameters		Compliance with the limit values given for these parameters in the Communique on Dangerous and Hazardous Substances is compulsory.



**Table 10-23**

**Criteria for Deepsea Discharges**  
(Water Pollution Control Regulation, Table 23)

Parameter	Limit
Temperature	Regardless of the dilution capacity of the marine environment, the temperature of waters to be discharged into the sea must not exceed 35 °C. Hot water discharges may not increase seawater temperature as a result of the primary dilution (S1) physically caused by the diffuser by more than 1 °C in summer (June-Sept) or by more than 2 °C in the other months.
Total and Fecal Coliform in Most Probable Number (MPN)	Following total dilution by deepsea discharge in protected zones with human contact, the total coliform level in MPN must be less than 1000 TC/100 mL and the fecal coliform level less than 200 FC/100 mL 90% of the time.
Solid and floating material	Visible solid and floating matter at a diffuser exit must not be found outside a strip the total width of which is equal to the depth of the sea at that point.
Other parameters	Compliance with the limits given in Table 3 is compulsory.



**Table 10-24**

**Wastewater Discharge Standards Envisaged in Discharges into  
Wastewater Infrastructure Plants**  
(Water Pollution Control Regulation, Table 25)

Parameter	At wastewater infrastructure plants whose sewerage systems culminate in total treatment	At wastewater infrastructure plants whose sewerage systems culminate in deepsea discharge
Temperature (°C)	40	40
pH	6.5-10.0	
Suspended solids (mg/L)	200	100
Oil and grease (mg/L)	250	50
Tar and petroleum-based oils (mg/L)	50	10
Chemical oxygen demand (COD) (mg/L)	4,000	600
SO <sub>4</sub> (Sulfate) (mg/L)	1000	1000
Total sulfur (S) (mg/L)	2	2
Phenols (mg/L)	20	10
Free chlorine (mg/L)	5	5
Total nitrogen (N) (mg/L)	(a)	40
Total phosphorus (mg/L)	(a)	10
Arsenic (As) (mg/L)	3	10
Total cyanide (Total CN <sup>-</sup> )(mg/L)	10	10
Total lead (Pb)(mg/L)	3	3
Total cadmium (Cd)(mg/L)	2	2
Total chromium (Cr)(mg/L)	5	5
Total mercury (Hg) (mg/L)	0.2	0.2

**Table 10-24 (continued)**

<b>Parameter</b>	<b>At wastewater infrastructure plants whose sewerage systems culminate in total treatment</b>	<b>At wastewater infrastructure plants whose sewerage systems culminate in deepsea discharge</b>
Total copper(mg/L)	2	2
Total nickel(mg/L)	5	5
Total zinc (mg/L)	10	10
Total tin (Sn) (mg/L)	5	5
Total silver (Ag) (mg/L)	5	5
Cl <sup>-</sup> (Chlorine) (mg/L)	10,000	
Surface active substances	Discharges of substances the biological decomposition of which in line with Turkish Standards is impossible is prohibited on principle.	

**(a) These parameters shall not be considered in wastewater analyses.**

<b>INSTALLATION:</b>	<b>COMPLIANCE CATEGORY:</b> <b>WATER QUALITY MANAGEMENT</b> <b>Turkey</b>	<b>DATE:</b>	<b>REVIEWER(S):</b>
<b>STATUS</b> <b>NA   C   RMA</b>	<b>REVIEWER COMMENTS:</b>		

(1) BCE (Environmental Planning) (2) BEE (Bioenvironmental Engineering) (3) Wastewater Treatment Plant Superintendent